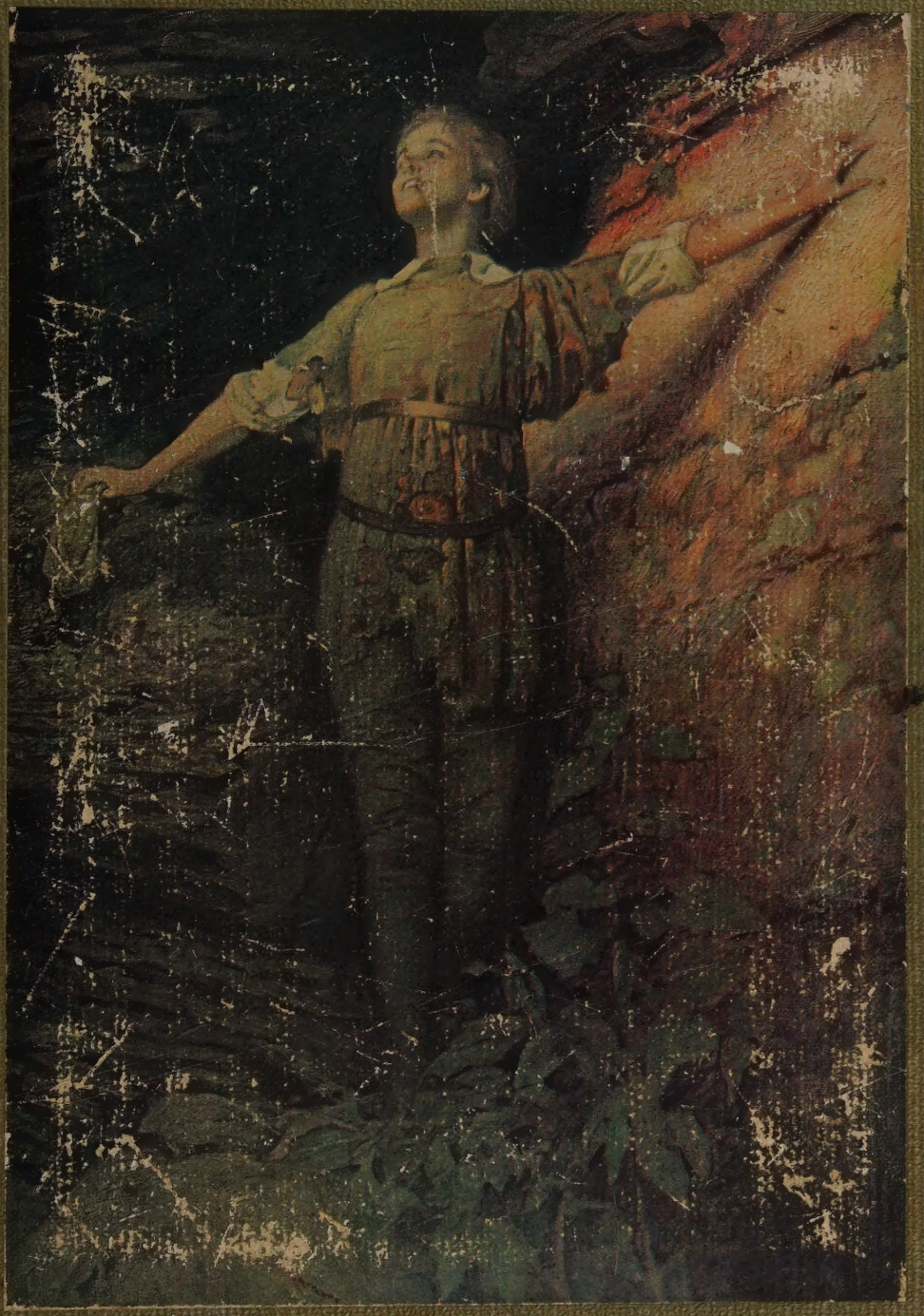
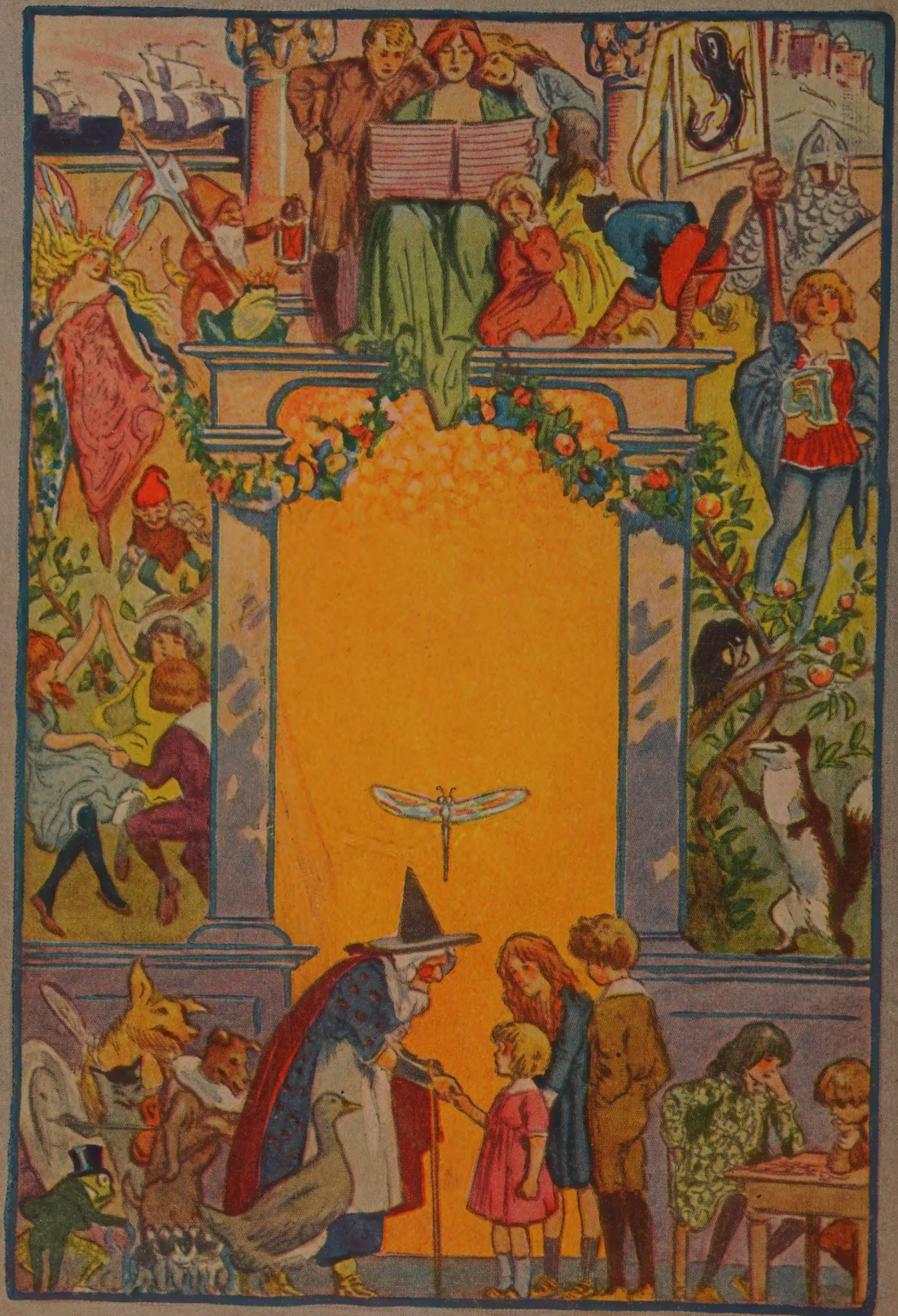




SCIENCE
ART

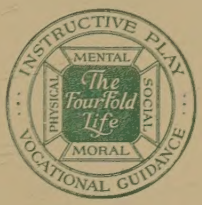
PICKING WILD FLOWERS

FROM A DRAWING BY LILLIAN A. GOVEY

The HOME UNIVERSITY BOOKSHELF

PREPARED UNDER THE SUPERVISION OF

THE EDITORIAL BOARD *of the* UNIVERSITY SOCIETY



VOLUME VII

NATURE, RECREATION, AND PHYSICAL DEVELOPMENT

THE UNIVERSITY SOCIETY
INCORPORATED
New York

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INTRODUCTION

THERE are so many different things of interest in this volume that its title, "Nature, Recreation, and Physical Development," only faintly reflects them. Let us, then, take a little pilgrimage into its contents. We can only introduce the boy and girl to it after we are fairly acquainted with it ourselves.

A glance into the opening pages, with their alluring title, at once tells us what first to expect. Here are a series of color pictures of mammals, under the caption, "A Visit to a Picture-Zoo." Each mammal is described in an easy, chatty style, but with its important features noted. These little stories can be read aloud to even the youngest children of walking and talking age, for the child is instinctively interested in animals. Forty of the most familiar ones are housed in this "Zoo," and this part of the book will doubtless be thumbed over and over again.

Next comes a section devoted to Birds—sixty or more of them, all shown in full color. There are swimmers and divers, hawks, eagles, vultures, owls, and finally the songsters. Opposite the pages of glowing color-plates are brief but clear descriptions, giving just the facts the child should know and wants to about each bird—its plumage, its size, its habitat, its song, and so forth. Again the style is of the simplest, so that the nature-loving child at an early age will be tempted to read for himself and to identify the birds which fly about his home.

"Animal Stories for Children" follows—a group of cleverly told tales which still further familiarize them with well-known mammals. This is succeeded by "Verses About Birds and Animals."

Leaving our feathered and furred friends, we plunge far back to a time when the earth was new. In "Once Upon a Time," by the famous nature-writer, Lillian Gask, we have a wonderful story of a boy named Phil, who meets the "little Professor," who knows all about prehistoric animals and the Tree-men and Cave-men. He tells Phil about these rough barbarians who had to learn for themselves the simplest things—how to hunt, how to make fires, how to cook, and finally, how to write rude inscriptions upon the rock walls. These men lived many thousands of years ago; they dressed in skins and hunted mammoths and other huge beasts. The pictures which accompany these tales of the long ago are graphic and interest-compelling.

Now follow other nature talks under various headings, some being presented as fairy tales. John and Jenny learn about Water, the Metals, the Plants, the Winds, the Seasons. They "learn to look about them," and in a series of lessons are told still more about the great outdoors—Jack Frost, the Woods, the Fields, the Trees, Weeds, the Insects. Still other lessons follow on the Air, the Sky, the Sun, the Stars, Clouds and Rain, the Wind and the Weather, things that grow in the ground, Bees, a Lump of Coal, and others. These lessons are followed by questions which are excellent for review purposes. We suspect that many a grown-up will scratch his head in search of an answer to some of the every-day facts of natural science. So—for your own protection—when your inquiring youngster strikes this section, in the words of the Boy Scout motto—"Be prepared!"

"Wonders of Nature" come next, with pictures and descriptions of some of the world's great scenic spots—waterfalls, caves, cañons, natural bridges, deserts, plateaus, glaciers, and the like.

Leaving nature, at last we arrive at the second great sub-division of this volume—Recreation. "Outdoor Games and Sports" are here included in generous measure with full details as to how to play them. "Indoor Games" follow, and then "Illustrated Puzzles and Charades," "Riddles, Charades and Conundrums," and "Puzzles, Tricks and Stunts." An endless amount of entertainment is provided, not only for one's own household, but also for the party, both indoor and out. The hostess need never be at a loss for ideas with this material at hand.

But still our volume is not exhausted. As in a magic grab-bag, there is always something more. In a final section the child's health is taken up—surely one of the most important of all topics. Exercise is made into play. There are "Gymnastics for Little Folks," directions for making body-strengthening and fun-evoking playthings, and exercises and stunts for girls and boys approaching the 'teen age.

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A VISIT TO A PICTURE-ZOO

Who of us doesn't like to pay a visit to the Zoölogical Park—or the "Zoo," for short? Have you one near your home town? If you haven't, I hope you will soon have a chance to go to one in the nearest big city; for it's chock full of interesting things to see.

Sometimes the circus comes along with its menagerie—a lot of cages with wild animals inside of them, and a string of big elephants stalking along sedately on the outside. That's exciting, too, but it isn't near so much fun as the Zoo. For one thing, you aren't in a hurry at the Zoo, as you are at the circus. You can go out to the big park and spend a whole day if you want to.

If it's summertime, you will see open-air cages with all sorts of wonderful animals—just as if they had stepped right out of your story-book. There will be bears and lions and tigers and wolves and ever so many others. Then, over in the open spaces, you may see buffalo and elk and deer and busy little prairie dogs. A shrill chattering near-by will prove to be the monkeys greeting you from their big cage all fitted up with trapezes and flying rings. You will want to watch them by the hour!

Yes indeed, a visit to the Zoo is one of the best trips ever. And, just to prove it, we are asking you to go with us on such a visit right now. Will you go? Good! Well, it is a *picture* Zoo, and you can go without leaving your cozy seat here in this room.

As you turn these pages, just imagine yourself walking along with Father or Mother in the big outdoor park, and getting acquainted with each animal as you come to its cage. It is better than any other game, for when you do go, one of these fine days, to see the real animals, you will know all about them. You can walk right up and say: "Good morning, Mr. Bengal Tiger!"

Won't that be fun?

J. Walker McSpadden

BARBARY LION. © NEW YORK ZOOLOGICAL PARK. B

BARBARY LION

THE Lion is called the "King of Beasts," because he is feared by nearly every other animal. They run in fright just at the sound of his roar through the forest. He is so big and strong that when he leaps through the air he can strike down an ox. The Lion is easily known by his great tawny mane, like a fur collar about his neck. His mate, the Lioness, does not have this collar. Most Lions live in Africa, but some are found in southern Asia.

PUMA

SOME years ago, when America was a wilder country than it is today, the Puma was a much-feared animal. It was also called the Panther, the Painter, the Catamount, and the Mountain Lion. It looks something like a Lioness, as it hasn't the shaggy mane of the Lion and its kinsfolk, as both belong to the tribe of cats. Some Pumas were seven or eight feet long and weighed over two hundred pounds. So you can see why the hunters were wary about encountering them. It is a rare animal nowadays.

PUMA. © NEW YORK ZOOLOGICAL PARK. E

LION CUBS. © NEW YORK ZOOLOGICAL PARK. F

LION CUBS

PERHAPS, if you are very lucky, you will see some real Lion Cubs some day. Every now and then a litter of three or four of these roly-poly brown babies comes to make Father Lion and Mother Lioness proud and happy. They are playful as kittens, and look not unlike them, although as big as a full-grown cat. You know, the Lions, as well as many other large beasts, belong to the cat family. I'll wager, if you stroked these, they would try to purr.

BENGAL TIGER

THE Bengal Tiger is the largest member of the cat family, next to the Lion. It is found in India and other parts of Asia, and hunters go after it mounted on trained elephants. The Tiger is one of the most savage of beasts, and does not hesitate to dash into a native village and carry off a child. That is why it is hunted to the death. Unlike the Lion, it is striped, as you can see by the picture, and also has a striped tail. Even its head has bands of color running over it, as though its face needed washing.

BENGAL TIGER © NEW YORK ZOOLOGICAL PARK. E

INDIAN LEOPARD. © NEW YORK ZOOLOGICAL PARK. F

INDIAN LEOPARD

THIS is another great "cat," which you can easily distinguish from the Lion and the Tiger, as the Leopard has dark spots all over it. Even its face and tail have spots. Its head, however, is much like that of the Lioness. The Leopard is long and slender, an active and powerful animal, and as much feared in its native haunts as either of the other two great "cats" just mentioned. It is found in both Asia and Africa, but if you are like me, you will prefer to find it in a good stout cage.

CHEETAH

HERE is a curious animal, as it looks something like both a cat and a dog. In fact, it is regarded as a sort of connecting link between the two—a cousin of each, as it were. The Cheetah is related to the Leopard and has spots like it, but smaller in size, and its legs are longer. It can run very fast indeed, and is often trained in India and other lands to hunt other game. It will outrun the antelope, and jump on that pretty creature and drag it to the ground. It can be tamed, just like a dog.

CHEETAH. © NEW YORK ZOOLOGICAL PARK. A

JAGUAR. © NEW YORK ZOOLOGICAL PARK. B

JAGUAR

THE Jaguar is another American "cat," and is larger than the Ocelot. Its markings are generally darker and in regular patterns. It more nearly resembles the Leopard and is almost as large. The Jaguar is much feared by the natives of South America, as it is very savage, and does not hesitate to attack either man or beast. It can leap long distances, and a single blow from its huge front paws will fell a deer or even an ox.

OCELOT

HERE is still another animal that looks like the Leopard, but it is much smaller, and if you look closely you will see that its markings are different. It has both spots and stripes. The Ocelot likes to prowl about at night, and its eyes open larger, just like those of a house cat, so that it can see its way in the dark. It lives in the dense woods, and is found from southern Texas down into South America. Some people call it the Tiger Cat.

OCELOT © NEW YORK ZOOLOGICAL PARK. E

ALASKAN BROWN BEAR. © N. Y. ZOOLOGICAL PARK. F

ALASKAN BROWN BEAR

IMAGINE a Bear so big, that when he rears up on his haunches he stands nine and a half feet high — that is, as high as you would be if you stood on Father's shoulders! Well, that was just the size of this big handsome fellow who used to live in the Bronx Zoo, at New York. But despite his size, he had a friendly disposition, and the children had great fun watching him catch the loaves of bread that were slung into his big cave for his dinner. As the name indicates, this Bear is a beautiful brown color, and he is the biggest of all.

RUSSIAN BEAR CUBS

WHEN these Bears' pictures were taken, they were about four months old. They were pretty active for such young babies, but then Bears grow up a lot quicker than folks do. These would roll about and cuff each other, and they kept children in a gale of laughter by their antics. Their parents came from far away Siberia and were cousins to the Alaskan Brown Bears, although not quite so large. They are golden brown in color.

RUSSIAN BEAR CUBS. © NEW YORK ZOOLOGICAL PARK. C

POLAR BEARS © NEW YORK ZOOLOGICAL PARK.

POLAR BEARS

I HAVE always thought it very strange that Polar Bears preferred cakes of ice to a nice warm mattress—but that's what they do. When at home they live away up in the Arctic Zone, where it's winter most of the time; so nature has provided them with a very thick coat of fur and plenty of fat underneath. Likewise, living where there's so much snow and ice, they have beautiful white coats, so that their enemies cannot so easily see them. Despite their large size they move quickly and swim and dive gracefully.

GRIZZLY BEAR

THE Grizzlies used to roam at large in the Rocky Mountains, and many were the stories of hunters who had fought with them—not always to the advantage of the hunter, as the Grizzly, when cornered, fears no man. Now, however, they are rarely met, and if men will let them alone, they will mind their own business. The Grizzly is very heavy set, with powerful paws armed with claws that look as if they needed a manicure. When fighting, they rear up and often hug their victim to death.

GRIZZLY BEAR. © NEW YORK ZOOLOGICAL PARK. C

RED FOX © NEW YORK ZOOLOGICAL PARK. D

RED FOX

THE Fox is credited with being the slyest of animals, and he is indeed one of the keenest and most resourceful of beasts. He is not brave, preferring always to use his heels and bide his time. But he is especially fond of nice tender chicken. The Fox makes his den in holes in rocks, or under stumps or tree roots, but usually has more than one such place. If he sees or smells anything suspicious about one home, he at once moves, with his cubs and their mother, not even waiting until the first of the month.

ARCTIC FOX

THIS pretty animal is unlucky. It has such fine fur that it is hunted and killed for its coat, which brings high prices at the furriers. Another interesting thing is that its coat doesn't stay the same color. In Summer, when there are grass and leaves up north, it is a bluish gray; but in Winter it is snow-white. That is Nature's way of protecting the little animal. It is found in Alaska and various parts of the Far North, and on some Alaskan islands there are fox farms, for rearing them.

ARCTIC FOX. © NEW YORK ZOOLOGICAL PARK. C

GRAY WOLF

OF course you have heard the story of the Wolf that fooled Little Red Riding Hood. Well, he looked a lot like the Gray or Timber Wolf that is found in many parts of the United States. He sticks to the woods, however, and has been so much hunted that his lair is now in the densest and wildest parts. But in pioneer times, he did much damage. He would lie in wait around farms, to steal sheep or pigs or calves, and often he would kill full-grown cows. So a bounty or reward was offered for his pelt.

GRAY WOLF. © NEW YORK ZOOLOGICAL PARK. F

JACKAL

THE Jackal is an African cousin of the Wolf, but is somewhat smaller. It is a sneaking sort of beast—where the Wolf is brave—and carries its tail perpetually between its legs, with a hang-dog air. The Jackal is not an attractive animal, but has its uses nevertheless. It is a scavenger; that is, it devours dead bodies and refuse. In hot countries such as Africa this is very desirable, as it keeps the land cleaner and more healthful for people.

JACKAL. © NEW YORK ZOOLOGICAL PARK. A

PRONG-HORNED ANTELOPE. © N. Y. ZOOLOGICAL P'K. F

PRONG-HORNED ANTELOPE

YEARS ago this pretty little animal, with its reddish coat, long legs, and white back, was a familiar sight on the Western plains. At the slightest alarm away it would go, the spots of white looking like signals. But to-day, unfortunately, the Antelope is almost extinct. If you are lucky you may find one in the Park. Its pronged horns are hollow and grow annual rings.

AMERICAN ELK

AMERICAN ELK. © NEW YORK ZOOLOGICAL PARK. B

THE grown-up name of the Elk is "Wapiti," but few people call it that. The Elk is larger than the Deer and much wilder. It is now found in only a few parts of our country, but out West the Government protects the animals and feeds them in severe winters. The Elk gets tired of its old antlers, and each Spring sheds them and proceeds to grow a new headgear. In the picture, you will see the new antlers not quite full-sized, and covered with a fuzz, called "velvet." This is rubbed off later.

MULE DEER

THE Mule Deer got its name from the fact that it has large ears which stick straight up from its head, a good deal like a mule's. It is larger than the Virginia Deer, our most common variety, and is not so often seen, as its home is in the western and northwestern parts of the United States, and it does not thrive well in captivity. It is of more sober color than its European cousin, the Red Deer, and not so fine-looking.

MULE DEER. © NEW YORK ZOOLOGICAL PARK. D

RED DEER

THE Red Deer is found in America only in our Zoos, as its home is across the sea in Europe. It is the largest of Deer, being almost as big as our Elk, and has a smooth coat of rich reddish-brown. When it stands with slender legs planted wide apart for instant flight and head aloft, it presents a graceful picture indeed. There is no animal more pleasing to the eye than the deer, and this species is the most striking of all.

RED DEER. © NEW YORK ZOOLOGICAL PARK. F

FALLOW DEER. © NEW YORK ZOOLOGICAL PARK. A

FALLOW DEER

You can readily tell this pretty animal from any of its cousins, as its reddish-brown coat is dotted with blotches of white — at least, that is so in the summertime. Its antlers, also, are different from the rest; they are flattened in between the branches, much like those of a Moose. The Fallow Deer is a native of Europe, and if you ever go to any of the animal parks abroad, you will be sure to see it, as it is a great favorite.

BEAVER

As BUSY as a Beaver—so the saying goes—and it is not far wrong. For these active little animals work all day long, cutting down trees with their sharp teeth, and building dams so that the water of a brook may come up around their well-built houses. Many interesting stories are told about the Beavers'

BEAVER. © NEW YORK ZOOLOGICAL PARK. E

activity and intelligence. Fo
when a whole colony of them a
one or two will be posted as sen
they stand on guard stiff as ram
stranger or enemy should appear
go their flat tails on the ground,
stantly all of them plunge under wa
swim for home. I only wish I had
tell you more about them. Perhaps F
or Mother will. A Beaver is easily to
its flat, hairless tail and smooth, lus
skin. There used to be thousands of t
in this country, but they were hunted
persistently for their fine pelts that the
were nearly all killed. Now there are only
a few colonies, here and there, but they are
being protected, I am glad to say, and are
"getting busy" once more.

WOODCHUCK. © NEW YORK ZOOLOGICAL PARK. D

WOODCHUCK

HAVE you ever, in crossing a field, chanced to see a clumsy animal, about as large as a small dog, rear up to look at you and then lumber away? Well, that was a Woodchuck. Lots of folks call him a Groundhog, and the farmers have a saying that he can tell whether the winter is going to be long or short. You see, he hibernates—that means, he sleeps all winter in a warm hole in the ground, protected also by the layers of fat he puts on in the summer. On the second day of February he wakes up—so *they* say—yawns, stretches himself, and goes out to take a look at the weather. If it is a sunshiny day and he sees his shadow, he gives a disgusted grunt and goes back into his hole—and there are six weeks more of winter; but if it is a cloudy day, it means an early spring, and Mr. Groundhog begins to look about for his breakfast.

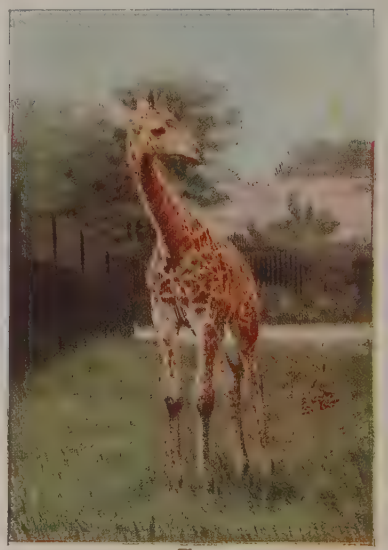
GREVY ZEBRA © NEW YORK ZOOLOGICAL PARK. A

ZEBRA

You just couldn't mistake a Zebra for any other animal, for he wears a uniform all his own. It is all stripes, and they are laid on as evenly as if some artist had sat down with a pot of paint and a brush and decorated him all over. He looks, in fact, something like a mule upon whom someone has played a practical joke. The Zebra's home is in Africa, the fellow shown in this picture having come from Abyssinia.

GIRAFFE

And here's another animal that couldn't possibly be mistaken for any other. The Giraffe has exceedingly long front legs and a neck so long that he can browse off the tops of trees. In fact, he does it; and he also uses his great height to look out over the plains and keep an eye on any possible enemy. He lives in Africa, and can run over the ground with surprising swiftness when pursued. He is very gentle when tamed. But to me the most curious fact about him is that he is dumb—cannot utter a sound.



BLOTCHED GIRAFFE. © N. Y. ZOOLOGICAL PARK. A

GRAY KANGAROO. © NEW YORK ZOOLOGICAL PARK. F

KANGAROO

While we are talking about queer animals, we mustn't overlook the Kangaroo—although that is just what the Giraffe would do. This funny beast comes from Australia. He has short front legs and feet, almost like hands, and extremely long hind legs, and a tremendous tail. He uses the said hind legs and tail in balancing his body and in making swift flying leaps when running away. But that's not the strangest thing about a Kangaroo—oh dear no! The mother Kangaroo has an outside pocket, for all the world like a shopping bag and into this she pops her babies when she wants to go anywhere. The little fellows stick their heads out of the pocket, and I suppose they imagine themselves in an airplane when she starts those flying leaps across country.

HIPPOPOTAMUS. © NEW YORK ZOOLOGICAL PARK. D

HIPPOPOTAMUS

While about as large as the Rhinoceros, the Hippopotamus (my, but those are long names!) is a milder-tempered animal. It likes to lie for hours in the water, with only its snout showing. In fact, its name means River Horse. It has an e-*nor*-mous mouth, which, when it smiles, reminds you of the lifting of the lid of a trunk. It eats a bale of hay in one day, and four good-sized loaves of bread only make a mouthful for it. How would you like to have the job of feeding it?

WALRUS

The Walrus lives up north, and is hunted by the Eskimos. When left undisturbed, it will sit for hours just as you see it in the picture, with its flappers (which take the place of feet) folded under it. The Walrus moves awkwardly over the land or upon ice, but swims swiftly, propelled by its four powerful flappers. It has a face like that of an old man, with a huge mustache. Some of them have two ivory tusks which stick down on each side of the mouth. These are dangerous weapons, as hunters have found, for he is ready to fight when cornered.

ATLANTIC WALRUS. © NEW YORK ZOOLOGICAL PARK. C

AFRICAN RHINOCEROS. © NEW YORK ZOOLOGICAL PARK. E

RHINOCEROS

If you should chance to see a huge beast with horns sticking straight up off the top of its nose—why, that would have to be the Rhinoceros. It is as large as an Ox, but with short legs, a very thick hide, and the ugliest of faces. It would be ugly even without the horns. And two small, wicked-looking eyes complete its fierce look. The Rhinoceros is, in fact, a very savage animal, and I for one want to be sure that the bars of his cage are extra thick.

SEA-LION

The Sea-Lion, which is the biggest of the Seal family, is found all the way from the Arctic Circle to the coast of California. Quite a colony of them live on the rocks just outside of San Francisco. Their habits are like those of the Walrus, and they are even better swimmers, as they are more slender. The Seal has been much hunted for his fine coat — which is its hard luck. But a good many Seals get off easier. They are captured and trained to do tricks, like dogs. They are quite clever and learn quickly.

CALIFORNIA SEA-LION. © N. Y. ZOOLOGICAL PARK. B

AFRICAN ELEPHANTS. © NEW YORK ZOOLOGICAL PARK. B

ELEPHANTS

What circus would be complete without the Elephant? In every parade it stalks along, as big as a small house, the observed of all observers. In the menagerie it is constantly at home to its many friends. Elephants are found in both Asia and Africa. The Asiatic type is trained to do various kinds of work and to carry people on its broad back. The African Elephant, such as you see in the picture, is much fiercer and is hard to train. It has much larger ears than its Asiatic cousin. Another peculiar feature about the Elephant is its large trunk, which is really a tremendously long nose. It uses this trunk to pick up its food, or other objects, just as you would use your hand, and it also sucks water through it like a hose. Two long, sharp tusks of solid ivory are another feature that will interest you as you study this biggest and best liked of animals.

ALPACA

ALPACA. © NEW YORK ZOOLOGICAL PARK. F

This very strange-looking animal is a cousin to the Camel. You can see that they look somewhat alike; only this fellow has a long neck, as though he were perpetually looking at something over the fence. But his legs, on the contrary, are shorter than the Camel's. Maybe that's why he stretches his neck. The Alpaca is found in South America. It is tamed and raised there, just as we raise sheep here, for its wool, which is thick and fine. Fine coats sold here in this country are made from its wool.

AMERICAN BISON

AMERICAN BISON. © NEW YORK ZOOLOGICAL PARK. F

Did you ever have a nickname so much better known than your regular, honest-to-goodness name, that everybody called you by that? Well, that's the case with the Bison in America. Everybody calls him a Buffalo. Before the western plains were cut up into farms, these great lumbering beasts roamed the land by the thousands. The Indians used to hunt them for their flesh and the thick coat, which made an excellent blanket. The white men also hunted them until they were almost extinct; but to-day there are several good-sized herds again. The picture shows what the Buffalo (beg pardon, Bison) looks like, better than I can describe it.

BIGHORN SHEEP

One of the wildest and hardiest of our American animals is the Bighorn Sheep, so called—as you will note from its picture—from its large, curving horns. Its home is in the Rocky Mountains, and hunters tell unbelievable tales of its courage and strength. It runs fleetly along narrow trails at the very brink of precipices, and takes flying leaps across yawning chasms such as no other animal will dare to attempt. When it jumps, it doubles up its four feet in such a way that they act like springs when it lands. It has smooth short fur, and does not look much like our domestic sheep, unless it should be some old, active ram.

BIG HORN SHEEP © NEW YORK ZOOLOGICAL PARK. A

MOUNTAIN GOAT

Another American animal which lives in our western mountains is the Mountain Goat. Its chief resemblance to our tame goats is in its face and two short, sharp horns. It is a shaggy animal, with long white fur, and is as fleet of foot and as much at home in the wild hill country as the Bighorn Sheep. Up a steep slope it will dash, where there isn't a trace of a trail, and it is a mystery how an animal with hoofs instead of claws can hang on. But hang on it does, and unless the hunter is in some vantage point the Goat will elude him and dash away around some rock wall that would seem impassable

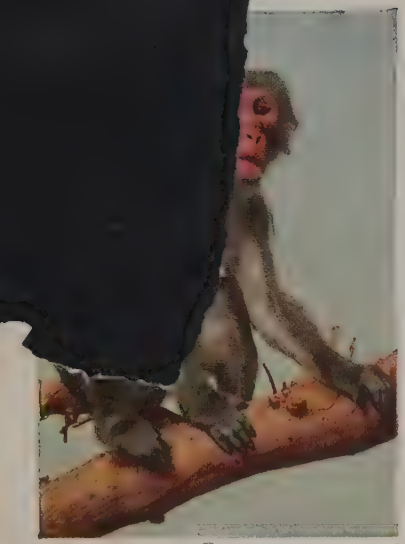
MOUNTAIN GOAT © NEW YORK ZOOLOGICAL PARK. E

PERSIAN IBEX

Away over in Asia Minor, on the other side of the Mediterranean Sea, lives a cousin of our Wild Goat. It is called an Ibex, and its body looks more like that of our tame goats, with its short brown hair and slender legs. But its horns are wonders—great curving things which reach nearly halfway down its back. A long pendent beard completes its curious appearance. No wonder the folks over there picked a queer name for it like Ibex!

PERSIAN IBEX. © NEW YORK ZOOLOGICAL PARK. D

RED-FACED MONKEY



RED-FACED MONKEY. © N. Y. ZOOLOGICAL PARK. C

THE Red-Faced Monkeys live, when at home, in far-away Japan. They are among the hardiest of the tribe, and are able to endure severe cold, on account of their heavy coats of long hair, which will also shed rain like your raincoat; so Mr. and Mrs. Red-Face do not pay much attention to the weather. Their smooth faces, framed in matted hair, give them a very droll look. They seem ready for any prank—and perhaps they are.

CHIMPANZEE

CHIMPANZEE. © NEW YORK ZOOLOGICAL PARK. D

THE Chimpanzee is the smartest member of the Monkey family. He can be trained until he is almost human. Bronx Park had one for several years that would eat at a table, using knife, fork, napkin, and other things much better than some boys and girls of whom I know. Another one, named "Susie," could tell one color from another, and count numbers. They are not only smart but affectionate little animals, and will try to do anything their masters tell them to do.

ORANG-UTAN

THIS is another of the Monkeys of larger size which, like the Chimpanzee, can be easily trained and becomes a great pet. It can be taught to eat with a spoon or fork, and to do many amusing tricks. It is so affectionate, that it will plead to be taken up and carried around, just like a baby. But it is mischievous too, and likes to steal things or play pranks. Altogether, it is one of the most interesting of the Monkeys.

ORANG-UTAN. © NEW YORK ZOOLOGICAL PARK. C

WHITE-HANDED GIBBON

THE Gibbons live in the Island of Borneo and in Southern Asia. They stay up in the tops of the tallest trees, and swing rapidly from one limb to another with the aid of their extremely long arms. They have white paws and white faces. When they want to summon help or call one another, they let out a piercing yell which can be heard a long way through the jungle.

GIBBON © NEW YORK ZOOLOGICAL PARK. A

HOW MANY BIRDS DO YOU KNOW?

Every time you go outdoors, even in the winter-time, you are apt to
And in summer they are all about you by the hundreds. Are they ju
to you—or can you call them by name?

You know, the birds have family names, just as you do. Suppose
knew *you* when you walked down the street. They would say, "Oh, tha
another child," and pay no more attention to you. They would never ca
"How are you, Susie?" or "Good morning, John!"—if that happened to l
name. Wouldn't you feel sort of neglected?

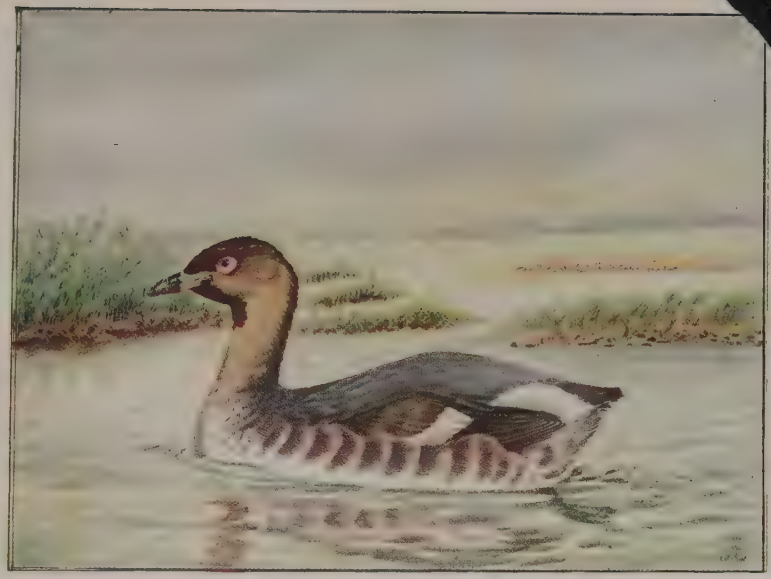
Well, the birds are some of the nearest neighbors that you have. M
them are very friendly and useful neighbors. Some of them sing very s
Wouldn't you like to be able to say: "Oh, that is a Robin," or "Good mo
Jenny Wren?"

You cannot get acquainted with them all, in just a day or two, because there are so many. But keep your eyes and ears open, and you will soon know lots of them. It will give you a far greater joy in the out of doors, and make your walks very interesting indeed. The spring is a fine time to watch for them, as then they come back from the south, one or two at a time, and you can be a reception committee to greet them.

In the next few pages we are going to tell you about some of the birds that you ought to know personally. We will begin with swimming and diving birds, such as the Gulls and the Terns; then introduce you to some waders, such as the Herons and Cranes; then show you some larger land birds; and lastly some songsters.

The pictures will give you a good idea of what they look like, and later when you grow older, we hope you will read bigger books about them. For they are an interesting and important part of our outdoor world. This would be a dreary place indeed without our Birds!

J. Walker McSpadden



PIED-BILLED GREBE (1/6 nat. size)

RAZOR-BILLED AUK (1/6 nat. size)

LOON (1/6 nat. size)

HERRING GULL (1/6 nat. size)

FROM DRAWINGS BY R. I. BRASHER

GREBE

People often say: "He swims like a duck." But here is a bird that swims *better* than a duck. The Grebe is just about the best swimmer ever. This picture shows a common variety called the Pied-billed Grebe, because of the peculiar markings on its bill. It lives so much in the water that it has been nicknamed the "Water-Witch." It has other names in different parts of our country, for it roams over a good deal of ground—or rather, water. Some folks call it the Dabchick, and others, the Dipper. If it wants to hide, it can sink down under the water until only its eyes and the point of its bill stick out. Then nobody can find it, and even the sharp-eyed Hawk is baffled. This Grebe is about a foot long, and of a dark brown color.

AUK

Hasn't this fellow a curious-shaped beak! He is a member of the numerous Auk family, and is called the Razor-billed. I should hate to have him bite me. These Auks live up north, from southern Greenland down as far as the coast of Maine or farther. Look it up on your map. They are very active and like to fish. They rest on the water as lightly as a cork, and if they see a fat fish down under the water, quick as a flash they go after it, so neatly as to leave scarcely a ripple. And they can fly as well as swim. Flocks of Auks are seen far out at sea. If you ever should see one, you could easily tell it by its bill and the black back and white shirt. It is about a foot and a half long.

LOON

You may have heard some one called "As crazy as a Loon"—although I hope not. But as for the Loon itself, it is a smart bird. Maybe folks call it crazy because it has a funny kind of long-drawn-out cry which can be heard a long way off. It may make you shiver, the first time you hear it. Loons are found in the upper part of the United States and Canada, especially where there is plenty of water. It even builds its nest right at the edge of a lake or stream, and the chicks learn to swim before they know how to walk. Its chief food is fish, so of course it can swim and dive well; but it is not so good in flight, and still worse when it tries to run on dry land. Maybe that's when it's crazy. Some Loons are quite large, from two to three feet long, and they are variously marked.

GULL

If you have ever been to the seashore, you have doubtless seen the Gulls. They are everywhere, swooping around in graceful circles, or resting easily on the water. They can even sleep there in calm weather, and Gulls will stay out at sea for days at a time, only coming in when there is danger of a storm. The Herring Gull shown in our picture is the most common species, and it varies in color from pure white to a grayish blue. Some of them are nearly two feet long, but as they wheel past, they look much smaller. They are fond of fish, oysters, clams, and in fact almost anything in the shape of food. They will follow a ship for days, to catch anything the cook throws overboard.

WILSON'S TERN (1/5 nat. size)

LEACH'S PETREL (1/3 nat. size)

DOUBLE-CRESTED CORMORANT (1/6 nat. size)

BROWN PELICAN (1/12 nat. size)

FROM DRAWINGS BY A. I. BRASHER

TERN

THERE are over fifty species of Terns, so you see it is rather a large family. Then they are also kin to the Gulls, and others of the Long-legged Swimmers. They are sometimes called "Sea Swallows," as with their slender bodies and long powerful wings they can dart through the air as swiftly as Swallows. And what wonderful endurance they have! Terns have been known to fly from the Arctic Circle clear down to the Antarctic—and back again. That's from one end of the world to the other—thousands upon thousands of miles! Terns are of many colors. This one in the picture is as white as snow, except for its black cap. They are about the size of the Gulls, but longer and more slender.

PETREL

THE Petrel is another bird familiar to everyone who crosses the ocean, for it is found far out of sight of land. It is not a big bird, like the Gull or the Tern, but a tiny little fellow no larger than a Swallow. How brave it must be to venture so far out! Folks have nicknamed them "Mother Carey's Chickens." Instead of tucking their feet up in their feathers when they are flying low over the water, they let them hang down, so that they seem actually to walk on the surface of the water; this is why they are called "Petrels," which means "little Peters." You remember how the Apostle Peter walked on the Sea of Galilee. They are a sooty shade of brown, and the one shown in this picture has a white streak on its tail pinions, like the markings of an airplane.

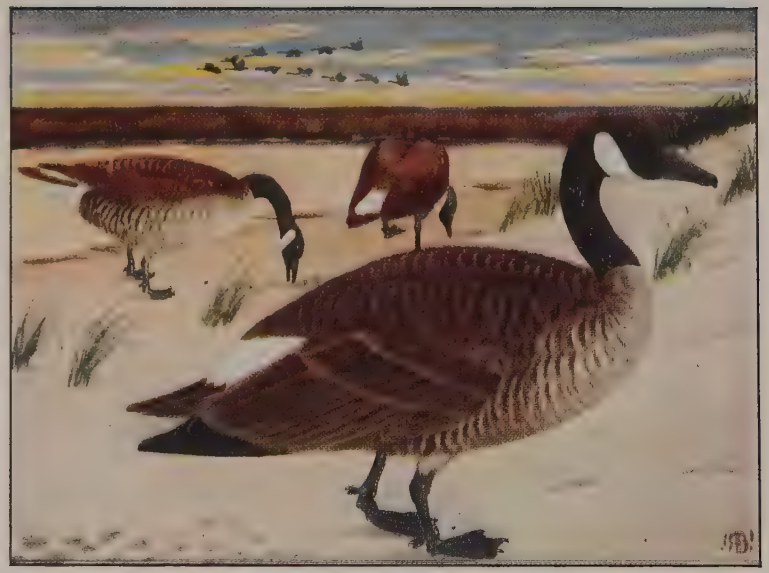
CORMORANT

WHEN a Cormorant gets after a fish, it doesn't have much chance—that is, the fish doesn't. Look at the picture and you can see why. With its strong webbed feet and blunt wings a Cormorant can swim rapidly, even when under water, and its beak is shaped almost like a fish-hook. So, what chance has the fish? Cormorants are wonderful divers as well as swimmers, but are not much on flying, and frequently build their nests upon the ground. You can see them on the rocks out in the Pacific, near San Francisco, or off the coast of Maine; and in winter they go as far south as the Gulf of Mexico. They are about three feet long, and are a greenish-black, with coppery wings.

PELICAN

IF YOU don't know what a Pelican looks like—just look at the picture! Did you ever see such a bill on a bird in your life? Seems as if it would give him a headache just to carry it around. But Mr. Pelican doesn't mind, as he finds it very convenient indeed for holding fish. He can stow a good-sized fish away there, and devour it at his leisure. These are big birds—four or five feet long—and look very awkward indeed as they sit on the shore or waddle along. They do not even fly gracefully. But once in the water, with that cavernous beak opened wide—then look out, Mr. Fish!

MALLARD DUCK (1/6 nat. size)



CANADA GOOSE (1/12 nat. size)

EIDER DUCK (1/6 nat. size)

WHITE IBIS (1/8 nat. size)

MALLARD DUCK

Of course you know what a Duck looks like—so whenever you hear of a Mallard Duck, just remember that it is a wild cousin of the barnyard fowl. But it is far stronger, handsomer, and more resourceful than the tame one. It can fly for long distances, going from the north to the south with the approach of winter, and returning north the next spring. But it is a hardy bird, and if it can find a sheltered cove where the water does not freeze over, it may remain north all winter. This Duck is about two feet long, and is beautifully marked with green head, grayish-brown back, chestnut breast, and red feet.

CANADA GOOSE

Have you ever seen a flock of wild Geese in flight? It is a wonderful sight. They pass by a mile above us, flying at faster than express-train speed and in a wedge-shaped mass. An old gander leads them, making the point of the "V," and the others spread out behind him—and how they do fly! In a night they can go from Maine to Florida. The most common variety is the Canada Goose, shown in our picture, a big bird (three or three and a half feet long) that you would never think could fly so fast and so far. As they fly they cry "Honk, honk!" and when the farmers up north hear them in the fall, they say: "Well, winter's coming."

EIDER DUCK

Here is a Duck about the same size as the Mallard, but very different in looks. Its neck and back are white; its tail and lower body brown or black. It often has a dark cap over its eyes. The Eider Duck has a curious habit. The mother bird will tear the downy feathers from her own breast in order to make a soft lining for her nest. These feathers are so fine that they are highly prized by people for lining pillows and comforters; so the birds are tamed and kept for this purpose. Eider Ducks are found in both America and Europe, but in larger numbers abroad, as there they are protected and tamed instead of hunted.

WHITE IBIS

Now we are going to tell you about some of the wading Birds, and the first one here in our pictures is the Ibis. Of course, being a wader, the Ibis has long legs and large feet—the feet serving to brace its rather ungainly body and also to keep it from sinking deeply into ooze or mud. It has a long bill, which is likewise of great use in searching about in shallow water for food. This species is a beautiful white, with black-tipped wings, and it is a pretty sight to see a long file of them flying together. They like to live in the south. They are about two feet long and quite as tall.

EGRET (1/12 nat. size)

GREEN HERON (1/6 nat. size)

BLACK-CROWNED NIGHT HERON (1/6 nat. size)

SANDHILL CRANE (1/12 nat. size)

FROM DRAWINGS BY R. I. BRASHER

EGRET

THE Egret has had a sad story. Its beautiful plumage has been its undoing. You will see in the picture the long white plume-like feathers which adorn its back. Well, these feathers have been coveted by people, to put on women's hats,—"aigrettes," they are called—and so the poor birds have been slaughtered by the thousands. The Egret is a tall graceful bird of the Heron tribe, and stands over three feet high. It has a long bill of dark color. The legs are also dark. The National Association of Audubon Societies is trying to protect the Egrets from being killed. Can't you help them?

GREEN HERON

THIS species of Heron is comparatively small, being only about a foot and a half long. As its name implies, it is a rich green in color on its back, with a neck of chestnut hue. It is not a sociable bird, and does not live with other members of its family in flocks as some birds do. Instead, it builds its nest off by itself—a mass of sticks in some lonely bush or low tree. It is fond of small fish and frogs and finds its long, swordlike bill of great use in spearing them. Fingers may have been made before forks, with persons, but the Heron carries his fork along with him.

NIGHT HERON

THIS Heron doesn't stay up all night, as you might think from its name, as it likes the daytime too. But along about twilight, it wakes up to the fact that it is rather hungry and a nice mess of fish would taste good. So with a loud and hoarse "Quawk!" it proceeds down to the nearest pond, swamp, or river. It has been nicknamed the Quawk, or Qua-bird from its cry. This Heron is finely marked, with a black crown and back and white underparts. Its wings and tail are gray, and it is about two feet long.

SANDHILL CRANE

THE Crane is built for deeper water than some of the other waders. It has long legs, is four feet in length, and has a wing spread of over six feet. When it flies, it seems all legs, wings, and neck. It likes to live in Florida and Louisiana, and despite its long legs which seem just made for wading, it really likes to hunt for its food on dry land. But here its legs still stand it in good stead, as it can see the approach of an enemy a long way off. When cornered, it fights fiercely, as many a hunting dog has learned to its sorrow, for the Crane's beak is sharp as a dagger.

WOODCOCK (1/2 nat. size)

BOB WHITE (2/5 nat. size)

SPOTTED SANDPIPER (1/2 nat. size)

RUFFED GROUSE (1/4 nat. size)

FROM DRAWINGS BY EDMUND J. SAWYER

WOODCOCK

The Woodcock belongs to the family of Shore Birds or Waders. It doesn't mind getting its feet wet on occasion, but if food is plentiful on dry land why so much the better. A nice dish of angleworms or grasshoppers suits it to a T. It has lots of nicknames—Big Eyes (because its eyes do seem a size large for it), Pewee, Mud Snipe, Bog Bird, and several others. You see, it is found in many parts of the country, from Nova Scotia to Florida. It is not quite a foot long, with brown back and orange chest. Two or three broad stripes on its head and a long, business-like bill, with its big bright eyes, make it easily remembered.

BOB WHITE

Some time when you are out in the country you are likely to hear a cheery whistle. It sounds like, "Bob White! Wheat's Ripe!" So persistently does the call come, that the bird has long since been christened, Bob White. In the north some folks call him a Quail, and in the south others say, "There's a Partridge calling." But he disputes them both; he says: "My name's Bob White!" If you should call on him in his home you probably wouldn't see him. His dusky white and chestnut coat blends perfectly with the grass and leaves. But hunters with dogs come along in the fall, as unluckily for him he is very good to eat. When they come too close—Whirr, whizz!—and away he goes like a shot. He is about ten inches long, and quite plump.

SANDPIPER

The Sandpipers are akin to the Snipes, and are also members of the Wading family. They can go around in the mud and water all day long without having their mothers say: "Don't stay in there too long, I'm afraid you will catch cold." No sir-ee—the Sandpiper boys and girls have some advantages. There are ever so many different kinds of Sandpipers, such as the Red-backed, the Purple, the Stilt, and others so called from their plumage or form. The one shown in this picture is a Spotted Sandpiper—you can see why. It looks as if someone had tattooed his shirt all over. These birds are about nine inches long.

RUFFED GROUSE

Here is another beautiful game bird, but so wild that only the keenest eye can see it in the woods where it hides. But sometimes the farmer boys hear a distant beating like the sound of a muffled drum, and eagerly they will creep up to get a sight of the drummer. If they are *very* lucky they may see him, but more often he sees them first; then with a thunderous roar of his wings he is gone. He is as large as a medium-sized turkey, and is sometimes called a Pheasant. His reddish-brown plumage makes him very hard to see—but that suits him first rate. He is "not at home" to anybody.

WILD TURKEY (1/12 nat. size)

MOURNING DOVE (3/8 nat. size)

TURKEY VULTURE (1/12 nat. size)

BLACK VULTURE (1/8 nat. size)

FROM DRAWINGS BY R. I. BRASHER

WILD TURKEY

When the first settlers came to this country and it was a wilderness, there were thousands of Wild Turkeys. The Indians used to hunt them, and the first Thanksgiving dinner given by the Pilgrim Fathers had Wild Turkey as a course. So persistently have they been hunted ever since, that they have almost disappeared from our fields and woods, A full-grown Wild Turkey is quite large. measuring nearly four feet to the end of its fan-shaped tail. It looks and acts very much like the tame ones you see in the farmyards but is far more active. Flocks of them by the hundreds used to fly for long distances seeking new feeding grounds. Wouldn't you have liked to see them?

MOURNING DOVE

If you should be walking through the woods and hear a heartbroken sort of moan coming from a tree a little way ahead—a sound as if there were no more joy in life at all and one might as well die and be done with it—the suffering bird would be the Mourning Dove. "Ooo!" it wails; "Ooo-ooo, ooo-ooo! That last grasshopper was tough!" But the bird is not really as sad as it sounds. It is blue-gray in color. It has a long neck and an extra long tail. It measures a foot from tip of beak to tip of tail, though you wouldn't think it. Farmers like this Dove, as it eats many insects and bugs that would otherwise destroy the crops. It is especially fond of weed seeds.

TURKEY VULTURE

The Vulture is one of the ugliest of birds, and you wouldn't want one for a pet. Their habits are—to say the least—not refined. They feed upon the dead bodies of other birds and mammals; but they are very useful for this very reason, as they keep the countryside clean and free from offensive odors. While ungainly and awkward on the ground, they are graceful in flight. Their powerful wings have a spread of six feet, and they can hover in the air hours at a time. They are extremely keen of sight, and can locate a dead rabbit from a point so far away that you wouldn't see the Vulture itself at all.

BLACK VULTURE

Some folks call this Vulture a Carrion Crow. It is smaller than the Turkey Vulture and in some ways resembles a Crow. It is of blackish color, with a naked head and neck and white feet. These Vultures are quite tame as nobody ever molests them and in some southern cities they can be seen calmly walking up and down the streets looking for any stray bits of food. So efficient are they as street cleaners, that people down there throw out garbage, instead of putting it in a can, knowing that within a few minutes the Carrion Crow will find it and clean up every speck of it.

COOPER'S HAWK (4/9 nat. size)

BALD EAGLE (1/16 nat. size)

SPARROW HAWK (3/8 nat. size)

OSPREY (1/8 nat. size)

FROM DRAWINGS BY R. I. BRASHER

HAWK

"As swift as a Hawk," the saying goes, and it is an apt one, for the Hawk is nothing if not sudden. Picture a peaceful farmyard on some sunny afternoon. The chickens are scattered about feeding or sunning themselves. Suddenly a dark shadow is seen on the ground, coming with express-train speed. Their dreaded enemy, the Hawk, drops like an arrow, seizes a half-grown chicken, and is gone —all within five seconds! These Hawks have powerful wings, spreading out three feet. They can carry off rabbits too, and their sudden attacks make them the most dreaded of the birds of prey.

BALD EAGLE

Every good American, little or big, knows what a Bald Eagle looks like as it is our national bird. What an air of majesty and power it has! Its eye is so sharp that we call all such "eagle eyes." Its wings are so broad and powerful that it can fly further and higher than other birds and carry an animal as large as a lamb away with it. Its wing-spread sometimes exceeds seven feet. High up on the side of a cliff it may build its nest —a rough affair of sticks—and to the mother bird and young the father bird will fly, perhaps for miles, bringing their supper—which may be a rabbit or choice fish.

SPARROW HAWK

There are a good many Hawks, big and little, but the Sparrow Hawk is the smallest and mose peaceful. In fact, it is inclined to be friendly with man. It will build its nest in the hollow of some old tree near the farmhouse, and it keeps the premises pretty clear of mice, grasshoppers, caterpillars, beetles, and other "small fry." So, when the farmer hears its cry of "Killy-killy-killy!" he doesn't get his gun, as he does when the big Chicken Hawk comes around. In other words, this fellow pays his board and keep. He is less than a foot long and has a chestnut-colored back.

OSPREY

The Osprey is often called the Fish Hawk; if you watched one awhile you would know why. It is the most patient fisher—and successful one too— of all the birds. The way it works is this. It will fly high in the air over the water, and so keen is its sight that it can see a long way down under the waves. When it has located the particular fish that it fancies, down it will dart—often many feet below the surface—fasten its long talons into the fish's back, drag it up, and fly away with it. So you see, it must be a strong as well as an agile bird. It is dark brown above and white below, and is about two feet long, but has a wing-spread of five feet.

SCREECH OWL (1/4 nat. size)

GREAT HORNED OWL (1/6 nat. size)

YELLOW-BILLED CUCKOO (3/8 nat. size)

BELTED KINGFISHER (1/4 nat. size)

FROM DRAWINGS BY R. I. BRASHER

SCREECH OWL

SUPPOSE you were going through a wood some dark night, when all of a sudden, right above your head, somebody said: "Whoo? whoo? whoo-oo?" I'll bet you'd jump and shiver! Some folks call this little Owl, which gives such a mournful note, the "Shivering Owl," and I believe that's a better name than Screech Owl, for its call is soft and wailing, and hasn't much of a screech about it. There are lots of Owls, and this is one of the commonest. It has round, staring eyes—as all Owls have—which see better in the night than in the day. So Mr. Owl usually sleeps in the daytime, and goes hunting at night—for mice and such titbits.

GREAT-HORNED OWL

THIS is a larger bird than the Screech Owl, and is called the Big Hoot Owl. It has a couple of tufts, like horns, on its head—hence its name. This Owl is nearly as destructive as the Hawk, for it is likewise a hunter; and as it does its hunting after dark, it is doubly dangerous. It will carry off chickens, ducks, and even small turkeys. Rabbits and partridges also fear it, for its lightning-like swoop, with clutching talons and cruel beak, offers little chance of escape. It has a mottled plumage of dusky brown color, and stands two feet high in its bare feet.

CUCKOO

YOU don't see a Cuckoo as often as you see some other birds, for it has a shy and retiring disposition. But often out in the country you can hear one—a long, throaty wail. "That's a Rain Crow," says the weather-wise farmer; "we'll have rain to-morrow sure." But why the Cuckoo knows anything about the weather, or why they call him a Crow, nobody knows. He certainly doesn't look anything like a Crow. He isn't black but brown and white—a slender little bird about a foot long, and half of that length is tail. The Cuckoo eats stacks and stacks of caterpillars, and thus saves much fruit and grain for the farmer.

BELTED KINGFISHER

ISN'T this a cocky-looking little bird? He looks and acts, in fact, as if he were "cock of the walk." Note that perky little crest on his head, the smart white collar he wears around his neck, and his sharp-tailed evening coat! And he is as smart as he looks. As a fisherman he is about the best ever. He will sit out on the limb of a tree, fifty feet above the water, and see, down in it, a minnow the size of your finger. Down he will drop like a plummet, hitting the water so hard you'd think he would knock his breath out; but with a sudden dive, up he comes and that minnow comes right along with him. The Belted Kingfisher can be easily recognized. He is about a foot long from the tip of his short tail to the end of his long beak.

DOWNY WOODPECKER (1/2 nat. size)

RED-HEADED WOODPECKER (7/16 nat. size)

FLICKER (3/8 nat. size)

WHIP-POOR-WILL (3/10 nat. size)

FROM DRAWINGS BY R. I. BRASHER

DOWNY WOODPECKER

A LITTLE black and white bird, with a sharp bill but friendly ways, is the Downy Woodpecker, which is found in many places east of the Mississippi River. It isn't much more than six inches long, but those six inches mean business! Watch one pecking away industriously into the side of a tree. It has found a decayed spot, and its keen scent tells it that under that wood is a borer that has no business in that tree. Tap, tap, tap! Come out, Mr. Borer! And Mr. Borer usually comes out, to be snapped up by the sharp little tongue inside the sharp little beak.

RED-HEADED WOODPECKER

IF YOU can't see the Downy Woodpecker easily, you certainly can't miss its red-headed cousin. In his uniform of red, white, and black he could be found even if he didn't do that noisy tapping on the side of a tree. But Mr. Red-Head is not at all bashful. He's handsome and he knows it. In addition to his pounding on a tree, as all his tribe do, he's noisy in his talk—a terrible gossip, who likes to talk things over with his neighbors and doesn't care who overhears him. He is a little larger than Downy, and sometimes varies his diet of bugs and grubs by trying the farmer's fruit.

FLICKER

THE Flicker is another member of the Woodpecker family, and is larger than the Red-Head. He has been called the Golden-Winged Woodpecker (which will give you an idea of his coloring), also the Yellow-Shafted Woodpecker and a lot of other names. He makes friends readily with other birds, such as Robins and Bluebirds, and if you will provide him with comfortable living quarters he may live right in your yard. You can always tell a Flicker by the crescent on his breast and the gay crest of red feathers on his head.

WHIP-POOR-WILL

YOU'LL remember this bird's *name*, at any rate; and if you ever hear his strange cry, around about twilight, you won't mistake it. "Whip-poor-Will!" he implores you in three long whistled notes that will be repeated time after time with a stop to take breath—once I counted seventy-seven times, and after a pause of about half a minute he was off again. But no matter how long you may hear the cry, you will rarely see the speaker himself. He is a very shy bird that only becomes bold enough to approach a house in the dusk.

BLUE JAY (3/10 nat. size)

CROW (1/6 nat. size)

BOBOLINK (1/2 nat. size)

MEADOWLARK (3/10 nat. size)

FROM DRAWINGS BY R. I. BRASHER

BLUE JAY

HERE is a bird, however, that you would never accuse of being modest or retiring. The Blue Jay struts around in his "baseball suit" as if he owned everything in sight. And to hear him arguing with the other birds, one would conclude he doubtless does think so. He has an ugly, hoarse call of "Jay! Jay! Jay!" but with all his faults he is a handsome bird, and he stays around up north all winter when most of the other birds are gone. The flash of his smart blue coat is a welcome sight. But he has a bad reputation with other birds. They call him a thief, and say that he robs their nests.

CROW

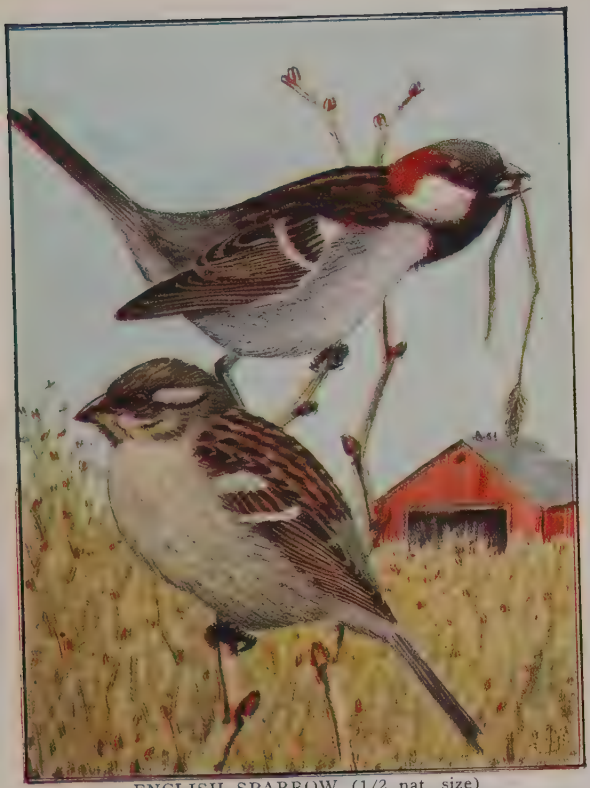
SPEAKING of thieves, this is one of the worst ever. The Crow is the pest of the farmer. It delights to tear up the young corn, and when the farmer rigs up a "scarecrow," the bird often laughs at it. The Crow is black—of course you know that—and is saucy, bold, active, and full of tricks. It knows right away whether or not the farmer is carrying a gun, and will then give him a wide berth. Another familiar feature about the Crow is its call—a long, searching "Caw! caw!" which you can hear for a mile or more. Crows like to flock together. Sometimes you will see a field fairly black with them.

BOBOLINK

IF YOU should chance to see a little bird, about seven inches long, with a black and white coat and a bluish black shirt, and this bird sang as if it were trying to split its head open, that would be Mr. Bobolink. He actually seems to go crazy singing. The Bobolink is a great traveler and goes under various names. In the South it is called the Rice Bird and the Reed Bird. It eats rice so greedily that it becomes quite fat, and so pays the penalty of its gluttony by being shot and served on someone's table.

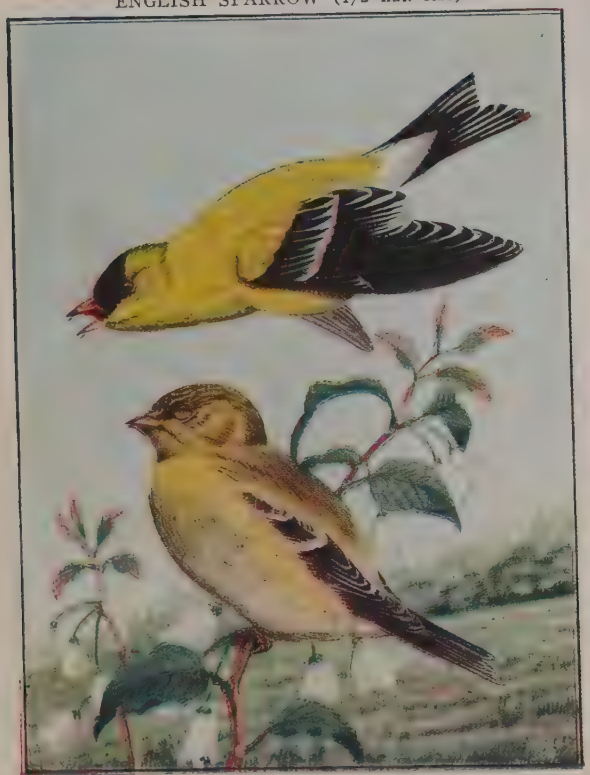
MEADOWLARK

THE Meadowlark is about the size of the Bobolink, and like Bob is a great singer —though he doesn't take it quite so seriously as Bob. Out in the open fields you may chance to see the Meadowlark, with his fine yellow breast set off with a crescent of glossy black. As he rises into the air his melody rises with him—a particularly charming song. Sometimes he will stay north all winter, cheerfully enduring the snow and cold, and making his meals off dried weed seeds. When he wants to vary his diet he hunts up a caterpillar.



ENGLISH SPARROW (1/2 nat. size)

CHIPPING SPARROW (1/2 nat. size)



GOLDFINCH (1/2 nat. size)

JUNCO (1/2 nat. size)

FROM DRAWINGS BY R. I. BRASHER

ENGLISH SPARROW

WHAT a perky little bird this is! It doesn't hesitate to attack feathered neighbors twice its size, and it usually wins out too. It came to our shores as a visitor and since then its family has grown so large that it can be found almost everywhere. Nobody likes it very much, it is so saucy and impudent, but little it cares what anybody else thinks. It is so sturdy that it stays north right through the winter, and you will often see it hopping about over the snow looking for seeds or crumbs. It is less than six inches long—a little reddish-brown bird—but it is "all there" all the time.

CHIPPING SPARROW

THIS Sparrow is far more popular than its English visitor. For one thing, it is tame and of a gentle disposition. For another, its song, while brief, is sweet. It likes to build around close to the house, and has been called the "Hair Bird" from its fondness for using horsehair in its nest. It is about the size of the English Sparrow, but is not quite so bright in color. Its coat is a rusty color, and its breast a dull gray. When you see this friendly little fellow hopping along looking for a stray worm, hail him as "Chippy." He will like it.

GOLDFINCH

STILL another small bird, about the size of the Sparrow, is the Goldfinch. He is a beauty, and I fancy he knows it, but it doesn't hurt his disposition. Do you want to meet him sometime? Well, if you should see a flash of yellow dart through the air and come to rest on a tree or fence, and it should show black wings and tail, you would be safe in saying, "Good morning, Mr. Goldfinch," Some folks call him the Wild Canary, for he looks a good deal like the caged variety and his song is quite as sweet. Sometimes he says, "Tic-o-ree! tic-o-ree!" and sometimes "Per-chic-o-ree!"

JUNCO

THAT'S a funny name for a bird, now isn't it?—Junco! But if you don't like that, I know you will like Snowbird, which is his ordinary, everyday name. This sociable little bird, which is about the size of the Sparrow, is one of the hardiest. He is found clear up in Alaska, and doesn't seem to mind a bit how cold it gets. There are several colors to his family plumage. One is called the Slate-colored Junco—you can see why from the picture. But there are Black and Blue and White Snowbirds—all a jolly lot as they jump about and chatter. Put out some crumbs for him, won't you, when winter comes round?

SONG SPARROW (1/2 nat. size)

CARDINAL (3/8 nat. size)

ROSE-BREASTED GROSBEAK (1/2 nat. size)

SCARLET TANAGER (1/2 nat. size)

FROM DRAWINGS BY R. I. BRASHER

SONG SPARROW

THE Song Sparrow is not quite so friendly as "Chippy." It prefers the quiet of some thicket or a fence corner to the porch or barn which Chippy may seek out. But in its quiet retreat it composes a whole lot of music—and such music! Opening its little throat it fairly pours itself forth in song. And passers-by stop and listen with delight. They recognize its talent by the name they give it. The Song Sparrow is found in many parts of this country, in Canada, and even in far-away Alaska. It is a little over six inches long, and is brown, black, and white. But its song is pure gold.

CARDINAL

YOU know there is a shade of red called "cardinal," because the high Church officials wear robes of this color. Well, here is a high priest of song who flaunts his coat of red with the best of them. You can tell a Cardinal as far as you can see one—and somehow, just the sight of one makes the day seem brighter. There is no more strikingly handsome bird in all the woodland. And he is just as cheery as his coat. He calls out, "Cheer, cheer, cheer!" Or maybe it is a "Hip, hip"—just as if he wanted you to add the "Hurrah!" at the end. He is over eight inches long, and is found generally in the eastern part of the United States.

GROSBEAK

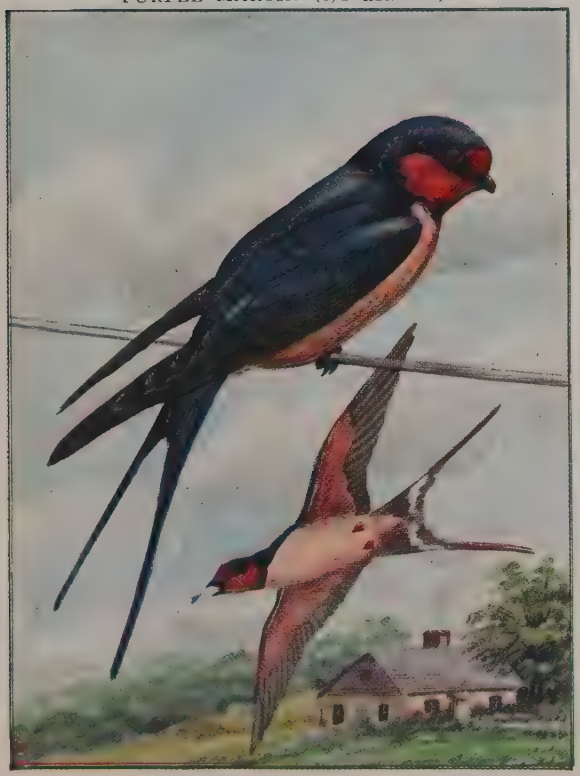
THERE are several kinds of Grosbeaks, but the handsomest of the lot is the Rose-breasted one. He is about the size of the Cardinal, and is strikingly marked with red, black, and white. The red or rose color is in a little patch on his breast, like a badge. He is not frequently seen, however, as he likes the thickets. But his song is well worth hearing, it is so rich and mellow. He has a terrible nickname—what do you think?—the "Potato-bug Bird," as he is particularly fond of these pests of the potato vine. So all the farmers welcome him.

SCARLET TANAGER

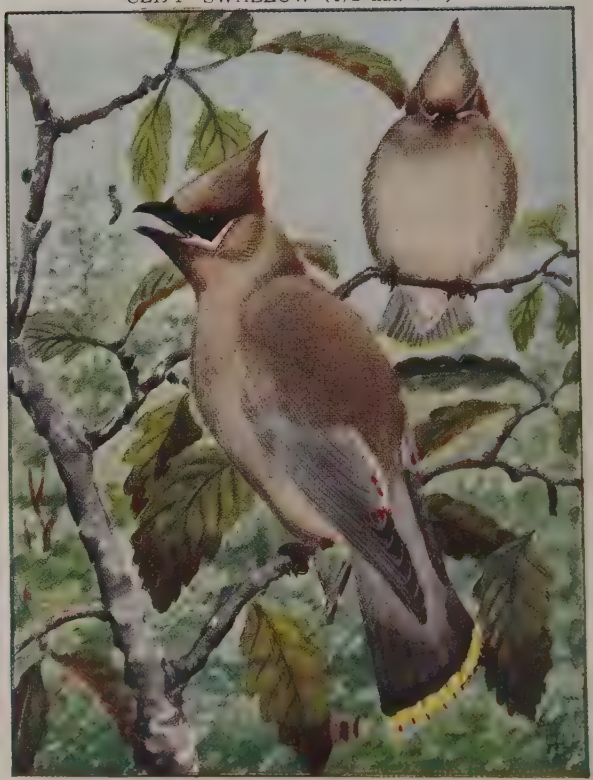
DO YOU want to know how to tell a Scarlet Tanager from a Cardinal? Well, the Tanager has black wings and tail. If the flash of red which darts across the road has those, you can safely call it a Tanager. And it is quite as beautiful and arresting as the Cardinal. Some people call it the Black-winged Redbird. When the farmer does his plowing in the early spring, this bird gets busy too, and follows along in the fresh furrows, picking up the grubs and worms that have been dug up. Later on in the summer it is lazier, but does not disdain a nice mess of caterpillars.

PURPLE MARTIN (1/2 nat. size)

CLIFF SWALLOW (1/2 nat. size)



BARN SWALLOW (1/2 nat. size)



CEDAR WAXWING (1/2 nat. size)

FROM DRAWINGS BY R. I. BRASHER

PURPLE MARTIN

THE Martins belong to the Swallow family. They can be told by their forked tails. This one is also called the House Martin, as it likes to live in houses built for it by its human friends. Down south, in front of the negro cabins, you will often see empty gourds hung up on poles or in trees, and there the Martins go to housekeeping quite happily. Another thing, they are sociable with each other. They like to live in colonies, and some Martin houses have five or six storeys. Don't you want to build a home for a family of them before next spring?

CLIFF SWALLOW

THIS Swallow, unlike its cousin the Martin, doesn't wait for somebody else to build a home for it. It prefers to plan and build its own—and it makes a good job of it too. It gets a quantity of mud together and moulds a bottle-shaped house, with a round hole for a front door, and the whole thing is fastened under the eaves of the barn, or in some crack of a cliff. It is also called the Eave Swallow, is only six inches long, and brightly marked in contrasting blue, white, and reddish tints.

BARN SWALLOW

A FRIENDLY and familiar figure around farms and gardens is the Barn Swallow —so called because it likes to build its nest on the projecting beams of the barn. The nest is a queer mixture of mud, straw, grass or twigs, and is lined with feathers. The Swallow flies in a peculiar darting manner, and this and its forked tail easily identify it. It has a steel blue coat and is about seven inches long. Now that the old barns are disappearing in favor of the tightly built garages, the Barn Swallows are hard put to it to find a convenient home.

CEDAR WAXWING

THIS is an aristocrat among the small birds. If you should chance to see one, you would catch your breath and exclaim, "My, what a beauty!" Indeed it is. First of all, there is a charming crest, then a blending of soft colors—drabs, browns, slates, pale blues, with a fringe of gold, and a touch of red—all united, with its graceful form and air of distinction, to make it one of the loveliest of birds. And it is said that the Cedar Waxwing is so polite, that if ten birds are sitting on a limb and one of them finds a cherry, it will pass it on to the next, and the latter in turn on down the line to the end.

OVEN BIRD (1/2 nat. size)

MARYLAND YELLOWTHROAT (1/2 nat. size)

MOCKINGBIRD (1/3 nat. size)

THRASHER (3/8 nat. size)

FROM DRAWINGS BY R. I. BRASHER

OVEN BIRD

If you should be going along through the wood, and should hear a bird calling excitedly, "Teacher, *teacher*, TEACHER!" —that would be the Oven Bird. What it wants with the teacher I don't know. Another peculiarity about it is its home. This is not a nest up in a tree but a house cleverly made of dried leaves or grass resting right on the ground, arched like a tiny oven. The Oven Bird is about six inches long, and has an olive coat and white breast with black spots. So it is very hard to see either it or its house, though you might walk right by them.

MARYLAND YELLOW-THROAT

You can see by the picture why this pretty little bird is called a Yellow-throat. Its top coat, however, is an olive green. It belongs to the Warbler family—that group of sweet singers—and it has an oft-repeated call which sounds like, "Witchery, *witchery*, WITCHERY!" — whatever that may mean. But it sticks to it, and will repeat the cry for an hour at a stretch. If you hear this call, walk up quietly and you may be rewarded by seeing the handsome fellow perched in a bush or low tree, cocking his head to one side and singing away for dear life.

MOCKING-BIRD

But when you talk about singers, here is one that puts them all in the shade, for it is not a bird of one refrain. It has a long list of songs that it will cheerfully sing for you, and when it runs short of them, it will begin to imitate some other bird. In fact, you can listen to the Mocking-bird—as it is called, from this curious habit of mocking others—by the hour. There have been songs written about this bird, and it is one of the most familiar and best loved of all. It is good-sized—about ten inches long—and has a brownish-gray coat and white and gray vest; just a quiet bird to look at, but my, how it can sing!

THRASHER

This is often called the Brown Thrasher, and you can see by the picture why. It has a long tail, which brings its full length to eleven inches. It jerks its tail up and down in a quick, nervous way, which reminds one of the way farmers used to thresh out grain with flails; and that is probably how it got its name. It is quite a songster, and has a trick of repeating the same refrain over and over again, as if trying to memorize it. Some people call it the Brown Mocking-bird, and others the Brown Thrush; others still, the Song Thrush. But it doesn't seem to mind.

WINTER WREN (1/2 nat. size)

LONG-BILLED MARSH WREN (1/2 nat. size)

WHITE-BREASTED NUTHATCH (1/2 nat. size)

TUFTED TITMOUSE (1/2 nat. size)

FROM DRAWINGS BY R. BRUCE HORSFALL

WREN

The Wrens are among the smallest and most fidgety of birds. They are never still a minute when away from home. They seem always to be going on an errand and being twenty minutes late. The Winter Wren, shown in the picture, is only about four inches long, but that's the busiest four inches you ever saw. It is reddish brown in color, and looks like "Jenny Wren," as the House Wren is called, but is even smaller than the fussy Jenny. It has a sweet, high song; but if anything bothers it, the song will change to an angry chatter. Yes, Jenny and her tribe are common scolds—but we like them!

MARSH WREN

There are two varieties of the Wrens that live in bogs and marshes—the Short-billed and the Long-billed. The last named like to live among the cat-tails along the shores of some sluggish river or bay, and they build remarkable houses which look something like cocoa-nuts, fashioned of interwoven rushes. These houses are so well built that they are almost waterproof. Inside is a downy little room, where Mrs. Marsh sits patiently upon the tiny speckled eggs until they are hatched. These Wrens are only five inches long, and have perky tails.

NUTHATCH

The Nuthatch family, of which there are several members, have a curious habit. They like to walk upside down. If you should happen to see one, like the White-Breasted fellow shown in the picture, as apt as not he would be marching headfirst *down* a tree instead of walking *up* it. He must think this is a topsy-turvy world. The Nuthatches are small birds, no bigger than the Wrens. They have sharp bills for searching in the cracks of trees for grubs, and a very inquisitive eye. They are friendly and tame if you do not disturb them, but they are *very* busy.

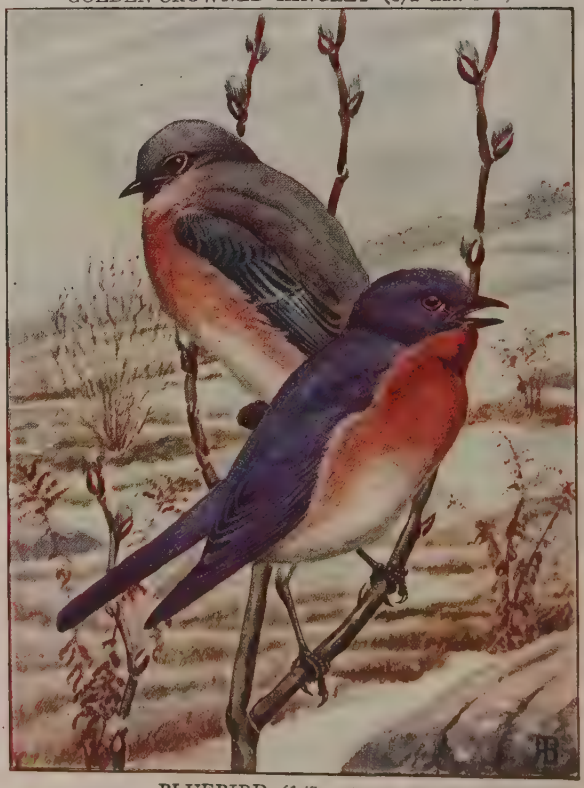
TITMOUSE

Still another tiny bird is the Titmouse. The Tufted fellow shown in the picture is a cousin of the Chickadee, and is smart and brimful of curiosity. He is dressed in soft gray, with a fine, showy, pointed crest. I'll bet he thinks he is a drum major. He is easily tamed, and has even been known to fly right into a house, through an open window, in search of a good place to build a nest. He has a loud and clear note, and doesn't stay still for a single minute. For such a small bird, he is wonderfully self-important.

CHICKADEE (3/5 nat. size)

GOLDEN-CROWNED KINGLET (1/2 nat. size)

ROBIN (3/8 nat. size)



BLUEBIRD (1/2 nat. size)

FROM DRAWINGS BY R. I. BRASHER

CHICKADEE

The Chickadee long ago got its name from its cheery chirp—"Chickadee—dee!" It is a little bit bigger than the Wren, though not much, and has the same quick, inquisitive, important ways that all these little feathered friends seem to have. It is a hardy bird, seeming to prefer the snowy wastes of Canada and New England to the warmer States. It is especially fond of red cedar berries, and makes itself much at home in the dense evergreen forests. Here, if you could peep in, you would see whole flocks of them darting about for all the world as if they were having a game of tag.

KINGLET

You would have to be personally introduced to this little bird in order to know it. For one thing, it is quite small—a regular hop-o-my-thumb of a bird (about four inches long)—and for another thing, it lives a good part of the time away up in Canada. The Golden-Crowned Kinglet comes south in the wintertime. The Ruby-Crowned, which has a dash of red on its head, seems to enjoy the bitterest and stormiest of weather. For such a tiny creature, with only a coat of feathers, this seems astonishing. But the Kinglet shows you that you can get used to anything.

ROBIN

Of course you know the Robin, that commonest and best liked of all our song birds. How we love to watch him as he hops about over the lawn, flaunting his bright red breast or searching out some likely spot for a nest. And how cheery is his song. His black head and sober coat still further distinguish him. And his friendly confidence in his human neighbors is another trait which endears him to us. He is easily the best known of all the birds, and endless stories and songs have been made in his honor. Mr. Robin's clothes are brighter than Mistress Robin's—just as if he wore new garments and made her wear the old faded ones. A Robin is about ten inches from tip to tip.

BLUEBIRD

Next to the Robin, we know and love the Bluebird. We now have a saying that the Bluebird stands for happiness. He also is a messenger of the springtime, and when we see his fine blue coat, his warm vest, and note his gentle manners, we greet him as an old friend of the family. Like the Robin, he is found nearly all over the United States. He is not quite so large as the Robin (about seven inches). If you have an orchard near your house, look there for him, as he likes to build his nest in a gnarled apple-tree trunk. Yes, he is a happy bird, and makes you happy just to look at him.

THE POLAR BEAR

The Polar Bear lives far away north, in the land of ice and snow. In his thick white coat, on his heavy feet, he wanders to and fro, looking for food; it 's mostly fish, but he often will make a meal (if only he can catch him!) on a nice fat brown young seal.

The Polar Bear swims very well: he also can contrive to swim right down under water, or to take a header and dive. He is very fierce and very wild: he is most amazingly strong, climbing about on rocks and bergs, hunting the whole day long.

The little Eskimo people, who fish with harpoon and hook, sometimes fight with the Polar Bear; their name for him is Nennook. And they generally win, and Mister Bear gets killed, because their big harpoons, that they can throw, are sharper than his claws. And they drag him home to their round snow-huts: oh, what a fuss they make, if they can have for supper a piece of tough bear-steak!

THE CROCODILE

In Egypt, by the river Nile, one sees the crawling Crocodile, among the rushes and the reeds, where the cranes go down and the ibis feeds. And he is dressed from head to tail in a scaly coat, a coat of mail. He lies and basks there half his time in sunshine, on the yellow slime. But if some person came to swim, and did n't chance to notice him until he saw those sharp white teeth just opening in the mud beneath, that horrid long red mouth agape, he 'd have a bother to escape. For Mr. Crocodile can run so very quickly after one! But fish are mostly what he swallows.

And while he basks, and wades, and wallows, he knows that he need have no fear of any enemies being near. Because, although it seems absurd, he has a friend, a tiny bird, who comes and hovers all about, or perches calmly on his snout, and lets him know, with curious cry, if danger should be drawing nigh. There 's no one so unprepossessing, but has a friend: O, what a blessing!

THE ELEPHANT

One cannot call the Elephant pretty, or say he 's a graceful figure. But he is so very big, you hardly could think of anything bigger. He has two large tusks, and a long thick trunk, and odd little twinkly eyes, and he is amazingly clever, and also remarkably wise. With his trunk, he can shut and open a gate, he can tie or untie a knot, he can turn a key, push back a bolt, pick fruit, and I don't know what.

He is trained to do all sorts of work, in India, where he dwells: carrying people, drawing logs; and everybody tells most curious tales of his sensibleness. He does n't like fish or flesh: he lives upon roots and herbs and leaves, and grass, if he gets it fresh. And he is patient, and mild, and good: he loves to obey his master; the smallest sign will make him kneel, or stop, or travel faster. He seems to like being ordered about, and having to work for men; and I even heard of an Elephant who tried to sweep out his den!

The baby Elephant 's very fat; it takes a long time to grow as big a size as its father—some thirty years or so. The mother is very kind to it, she will carry it tucked up tight in her trunk when she crosses a river—it must be a funny sight!

THE RHINOCEROS

THERE is, perhaps, no creature quite so ugly or so cross ~ as that leathery, clumsy, one-horned beast, the Black Rhinoceros. ~ Along the rivers of Africa he loves to plunge and wade, ~ keeping close to the reedy shore, for he likes the trees and shade. ~ He turns his little beady eyes cautiously to and fro, ~ to see if any harm is near. But presently he will grow ~ in a temper all about nothing; he 'll rush and rage and ramp. ~ All among the rushes and reeds, he then will snort and stamp, ~ and tear the trees to pieces, and tread the bushes flat: ~ and you, too, if he met you—there 's little doubt about that! ~ And in these fits of fury he will trample all the ground, ~ and root up all that grows in it, for half a mile around. ~

But when his temper lessens, and he feels a bit more cool, ~ he takes a little plunge-bath in the nearest river-pool, ~ and then he has his dinner: he always wants it quickly, ~ and it 's mostly ready for him. It is very hard and prickly. ~ What *do* you think he lives on? Indeed, you 'd never guess. ~ He eats the plant called "Wait-a-bit"; *Thorns,* neither more nor less! ~

THE TIGER

"HANDSOME is as handsome does," that 's what the old folks said. ~ Perhaps they had just then a thought of the Tiger in their head. ~ For though he has the handsomest skin that you could wish to see, ~ he 's very cruel, very fierce, as bad as bad can be. ~

In the Indian jungles where he lives, the other creatures go ~ as far as ever they can from him, they fear and hate him so. ~ For he will kill for killing's sake, not simply for his food; ~ and no respectable animal considers that is good. ~ He climbs along the heavy boughs, he crouches in the grass, ~ waiting to spring, like cat on mouse, on any who may pass. ~ And people come to hunt him, for they say, "We cannot stand ~ a savage Tiger roaming loose and frightening all the land." ~

They ride on great big elephants, they carry guns and shot. ~ But the Tiger would as soon attack an elephant as not. ~ Like some enormous splendid cat, all striped with gold and black, ~ he creeps beneath the bushes while he hears the rifles crack. ~ Till, suddenly, while the hunters think they must have killed him quite, ~ he fastens on the elephant, and then there *is* a fight! ~

THE WALRUS

THE Walrus lives on arctic shores, where it is very cold; ~ and you can hardly say that he is pretty to behold. ~ A kind of queer moustache, two tusky teeth, a body all too fat— ~ we ourselves should hardly like a make-up such as that! ~

He has a most ferocious face! If you should see him peep ~ around a great big iceberg, I surely think you 'd weep. ~ Still, ugliness may hide a nice kind heart beneath. ~

The Walrus climbs the rocks with help of long sharp teeth. ~ He eats the shrimps and seaweeds, and sometimes, I must tell, ~ the hungry greedy fellow eats up young seals as well. ~

He also fights the polar bear, the battle is fierce and hot, ~ and the Walrus, with his powerful teeth, will win as oft as not. ~

He is hunted very often for his tusks and for his skin. ~ First come the little Eskimos, and then the sailors begin ~ to follow him across the ice; and he either fights or runs, for he does n't like the big harpoons, nor the sound of the banging guns. ~

THE WOLF

THE Wolf is found in mountains, or in forests dark and drear, ~ sometimes in this our own land—I hope we 've none just here. ~ He simply hates being lonely; it makes him howl and whine, ~ like a dog left out at midnight when the moon begins to shine. ~ He likes to go a-hunting, with his friends, a countless number, ~ trotting across the snowfields while the other creatures slumber. ~ And then he 's fierce and cruel, for he 's starving for some meat: ~ it 's hard, when you are hungry, to keep your temper sweet. ~ But even after

dinner, he is never really good; ~ no doubt you know about the Wolf that met Red Riding-Hood. ~

And when the winter's very cold, and the frost is very hard ~ the folks in mountain villages, they have to keep on guard; ~ for the wolves come down in hordes from the dens where they have hid, ~ to find a woolly lambkin, or a little calf or kid. ~ All round the folds and farmsteads, they sniff and pry and prowl: ~ and if they're disappointed, my goodness, how they howl! ~

THE ZEBRA

One looks at him, and says, "Of course, ~ that is a horse. No, not a horse. ~ A donkey." Yet, on drawing near, ~ he is no donkey, that is clear. ~ All over stripes of black and yellow: ~ surely a very curious fellow! ~ But do not try to pat or stroke, ~ or you'll be sorry that you spoke. ~ For he has teeth and loves to bite; ~ and he can kick with all his might; ~ and he has lots of spiteful tricks; ~ and he is crosser than two sticks!

The Zebra, in his home afar, ~ in Africa, where forests are, ~ enjoys himself, and thinks it grand ~ to gallop in the desert sand. ~ But if he's caught, in the hope to tame him, ~ it makes him angry; who can blame him! ~ If you were shut inside a cage, ~ you surely would be in a rage, ~ to think of all the air and space ~ you had in your own dwelling-place. ~ And in the Zebra's native home, ~ there is such boundless room to roam. ~

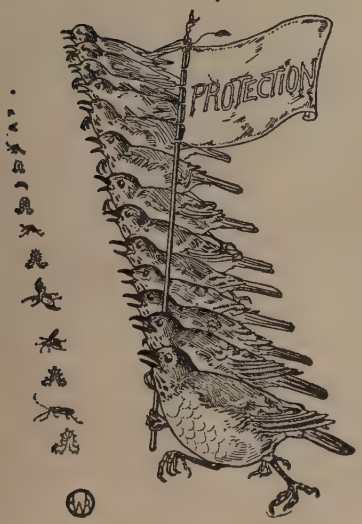
He lives on grasses, green or seedy; ~ for though he's cross, he's never greedy. ~ A few small blades of grassy stuff; a drink of water; that's enough. ~

Photo by G. Clyde Fisher

THE ROUND ROBIN

BY E. BARNES

E, Robin of the Maple Tree, and Robin of the Hill,
And Robin of the Currant Bush, and Robin by the Mill,
And Robin of the Berry Patch, and Robin up the Lane,
And Robin in the Lilac Top, and Robin in the Grain,
And Robin underneath the Eaves, and by the Chimney Stack,
And Robin at the Barnyard Gate, and o'er the Feeding Rack,
And Robin of the Cowshed, and Robin of the Pen,
And Robin of the Corn-field, and Robin of the Glen,
And of the Brook, the Lawn, the Hedge, the Silver Birch, and Green,
The Cedar Grove, the Ridge, the Slope, the Grape-vine, and Ravine—



DO, one and all, without dissent,
Make protest once again,
Against the slayers of the babes
Which we, with might and main,
Are trying hard to hatch and raise,
As careful parents should,
In all the good old-fashioned ways,
Of any decent brood;
To teach them to consume the pests,
The flies and grubs and bugs,
The beetles, borers, and the mites,
The vicious worms and slugs.

We only ask you half a chance,
Together and apart,
As tender husbands and as wives,
From out a swelling heart.
We make petition for our rights;
You could not live at all
If fields and gardens, fruit and trees
Were spoiled by things that crawl.

So, parents all, and teachers, too,
Please charge your girls and boys
To leave our dear blue eggs alone;
They were not meant for toys.
Just give your cats an extra meal
In our short nesting time!
It does not last so very long,
Nor cost a single dime.
And if we nip a cherry's cheek,
We 'll pay for it elsewhere;
Birds have to eat, as well as you.
We do not live on air!

We cry, we beg, we make appeal.
Oh, hear while there is time!
We 've written you this earnest plea
And put it into rhyme.
Oh, human folk, please do your part
And let our fledglings grow!
And HERETO in "Round-Robin" form
We sign our names below.

ALL THE ROBINS
Robin of the SLOPE
Robin of the GRAPE VINE
Robin of the RAVINE
Robin of the MAPLE TREE
Robin of the HILL
Robin of the CURRANT BUSH
Robin of the MILL
Robin of the BERRY PATCH
Robin up the LANE
Robin in the LILAC TOP
Robin in the GRAIN
Robin underneath the EAVES
Robin by the CHIMNEY
Robin at the BARNYARD GATE
Robin o'er the FEEDING RACK
Robin of the COW-SHED
Robin of the CORN-FIELD
Robin of the GLEN
Robin of the BROOK
Robin of the LAWN
Robin of the HEDGE
Robin of the SILVER BIRCH
Robin of the GREEN
Robin of the CEDAR GROVE
Robin of the RIDGE
Albertine Randall Wheelan

MR. AND MRS. SPIKKY SPARROW

BY EDWARD LEAR

On a little piece of wood
Mr. Spikky Sparrow stood:
Mrs. Sparrow sat close by,
A-making of an insect-pie
For her little children five,
In the nest and all alive;
Singing with a cheerful smile,
To amuse them all the while,
"Twikky wikky wikky wee,
Wikky bikky twikky tee,
Spikky bikky bee!"

Mrs. Spikky Sparrow said,
"Spikky, darling! in my head
Many thoughts of trouble come,
Like to flies upon a plum.
All last night, among the trees,
I heard you cough, I heard you sneeze;
And thought I, 'It's come to that
Because he does not wear a hat!'
Chippy wippy sikky tee,
Bikky wikky tikky mee,
Spikky chippy wee!

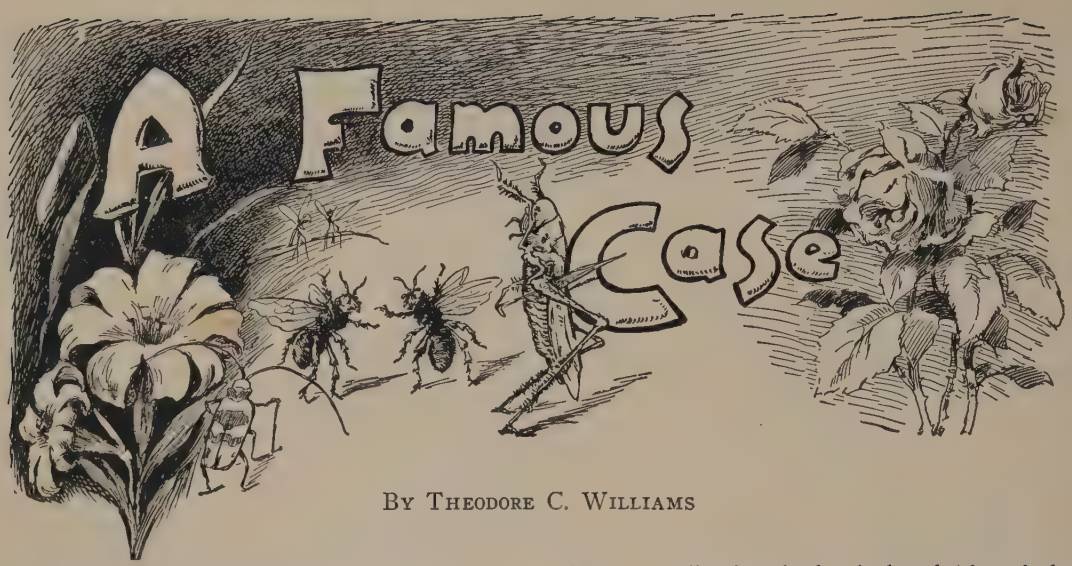
"Not that you are growing old;
But the nights are growing cold.
No one stays out all night long
Without a hat: I'm sure it's wrong!"
Mr. Spikky said, "How kind,
Dear, you are, to speak your mind!
All your life I wish you luck!
You are, you are, a lovely duck!
Witchy witchy witchy wee,
Twitchy witchy witchy bee,
Tikky tikky tee!

"I was also sad, and thinking,
When one day I saw you winking,
And I heard you sniffle-snuffle,
And I saw your feathers ruffle:
To myself I sadly said,
'She's neuralgia in her head!
That dear head has nothing on it!
Ought she not to wear a bonnet?'
Witchy kitchy kitchy wee,
Spikky wikky mikky bee,
Chippy wippy chee!

"Let us both fly up to town:
There I'll buy you such a gown!
Which, completely in the fashion,
You shall tie a sky-blue sash on;
And a pair of slippers neat
To fit your darling little feet,
So that you will look and feel
Quite galloobious and genteel,
Jikky wikky bikky see,
Chicky bikky wikky bee,
Twitchy witchy wee!"

So they both to London went,
Alighting on the Monument;
Whence they flew down swiftly—pop!
Into Moses' wholesale shop:
There they bought a hat and bonnet,
And a gown with spots upon it,
A satin sash of Cloxam blue,
And a pair of slippers too.
Zikky wikky mikky bee,
Witchy witchy mitchy kee,
Sikky tikky wee!

Then, when so completely dressed,
Back they flew, and reached their nest,
Their children cried, "O ma and pa!
How truly beautiful you are!"
Said they, "We trust that cold or pain
We shall never feel again;
While, perched on tree or house or steeple,
We now shall look like other people.
Witchy witchy witchy wee,
Twikky mikky bikky bee,
Zikky sikky tee!"



By Theodore C. Williams

Two honey-bees half came to blows
About the lily and the rose,
  Which might the sweeter be;
And as the elephant passed by,
The bees decided to apply
  To this wise referee.

The elephant, with serious thought,
Ordered the flowers to be brought,
  And smelt and smelt away.

Then, swallowing both, declared his mind:
"No trace of perfume can I find,
  But both resemble hay."

MORAL

Dispute is wrong. But foolish bees,
Who will contend for points like these,
Should not suppose good taste in roses
Depends on elephantine noses.

"I love thee for thyself alone,"
Said Mr. Wolf to Fair Dame Rooter.
"And for you constantly I moan:
Be mine, and bless an ardent suitor."

"Your love *is* warm," was her reply,
The hungry woodland gent discerning;
"But mine"—she winked the other eye—
"Beats yours a mile, because 'tis *burning!*"

MY DOG

BY ST. JOHN LUCAS

THE curate thinks you have no soul;
I know that he has none. But you,
Dear friend! Whose solemn self-control
In our four-square, familiar pew,

Was pattern to my youth—whose bark
Called me in summer dawns to rove—
Have you gone down into the dark
Where none is welcome, none may love?

I will not think those good brown eyes
Have spent their light of truth so soon,
But in some canine Paradise
Your wraith, I know, rebukes the moon,

And quarters every plain and hill
Seeking its master—as for me,
This prayer at least the gods fulfill;
That when I pass the flood and see

Old Charon by the Stygian coast
Take toll of all the shades who land,
Your little, faithful, barking ghost
May leap to lick my phantom hand.

THE BLUEBIRD

BY EMILY HUNTINGTON MILLER

I KNOW the song that the bluebird is singing,
Out in the apple tree where he is swinging,
Brave little fellow! the skies may be dreary,
Nothing cares he while his heart is so cheery.

Hark! how the music leaps out from his throat!
Hark! was there ever so merry a note?
Listen awhile, and you'll hear what he's saying,
Up in the apple tree, swinging and swaying:

"Dear little blossoms, down under the snow,
You must be weary of winter, I know;
Hark! while I sing you a message of cheer,
Summer is coming, and springtime is here!

"Little white snowdrop, I pray you arise;
Bright yellow crocus, come, open your eyes;
Sweet little violets hid from the cold,
Put on your mantles of purple and gold;
Daffodils, daffodils! say, do you hear?
Summer is coming, and springtime is here!"

THE MUSICAL FROGS*

BY JOHN STUART BLACKIE

BREKEKEKEX! coax! coax! O happy, happy frogs!
How sweet ye sing! Would God that I
Upon the bubbling pool might lie,
And sun myself to-day
With you! No curtained bride, I ween,
Nor pillowed babe, nor cushioned queen,
Nor tiny fay on emerald green,
Nor silken lady gay,
Lies on a softer couch. O Heaven!
How many a lofty mortal, riven
By keen-fanged inflammation,
Might change his lot with yours, to float
On sunny pond with bright green coat,
And sing with gently throbbing throat
Amid the croaking nation,
Brekekekex! coax! coax! O happy, happy frogs!

Brekekekex! coax! coax! O happy, happy frogs!
Happy the bard who weaves his rhyme
Recumbent on the purple thyme,
In the fragrant month of June;
Happy the sage, whose lofty mood
Doth with far-reaching ken intrude
Into the vast infinitude
Of things beyond the moon;
But happier not the wisest man
Whose daring thought leads on the van
Of star-eyed speculation,
Than thou, quick-legged, light-bellied thing,
Within the green pond's reedy ring,
That with a murmurous joy dost sing
Among the croaking nation,
Brekekekex! coax! coax! O happy, happy frogs!

Brekekekex! coax! coax! O happy, happy frogs!
Great Jove with dark clouds sweeps the sky,
Where thunders roll and lightnings fly,
And gusty winds are roaring;
Fierce Mars his stormy steed bestrides,
And, lashing wild its bleeding sides,
O'er dead and dying madly rides,
Where the iron hail is pouring.

* Some years ago, while living at Liebenstein, I took a stroll across the country on a hot summer's day; when coming near some low marshy ground I became aware of a concert of soft musical notes, floating up gently from the pools of water among the reeds. Never having heard anything of the kind before, I went close up to the brink of the water, and soon found that this most sweet discourse came from a colony of green frogs. Their music made such an impression on me, that on the way back to my water-quarters I wrote some lines as a memorandum of the event, and as a sample of the philosophy of enjoyment, in which frogs, belike, are sometimes wiser than men.

'Tis well; such crash of mighty Powers
Must be: the spell may not be ours
To tame the hot creation.
But little frogs with paddling foot
Can sing when gods and kings dispute,
And little bards can strum the lute
Amid the croaking nation,
With brekekekex! coax! coax! O happy,
happy frogs!

Brekekekex! coax! coax! O happy, happy frogs!
Farewell! not always I may sing
Around the green pond's reedy ring
With you, ye boggy Muses!
But I must go and do stern battle
With herds of stiff-necked human cattle,
Whose eager lust of windy prattle
The gentle rein refuses.
O if!—but all such ifs are vain;
I'll go and blow my trump again,
With brazen iteration:
And when, by Logic's iron rule,
I've quashed each briskly babbling fool,
I'll seek again your gentle school,
And hum beside the tuneful pool
Amid the croaking nation,
Brekekekex! coax! coax! O happy, happy frogs!

THE SANDPIPER

BY CELIA THAXTER

Across the narrow beach we flit,
One little sandpiper and I;
And fast I gather, bit by bit,
The scattered driftwood bleached and dry.
The wild waves reach their hands for it,
The wild wind raves, the tide runs high,
As up and down the beach we flit—
One little sandpiper and I.

Above our heads the sullen clouds
Scud black and swift across the sky:
Like silent ghosts in misty shrouds
Stand out the white lighthouses high.
Almost as far as eye can reach
I see the close-reefed vessels fly,
As fast we flit along the beach—
One little sandpiper and I.

I watch him as he skims along,
Uttering his sweet and mournful cry;
He starts not at my fitful song,
Or flash of fluttering drapery;
He has no thought of any wrong,
He scans me with a fearless eye.
Stanch friends are we, well tried and strong,
The little sandpiper and I.

Comrade, where wilt thou be to-night
When the loosed storm breaks furiously?
My driftwood fire will burn so bright!
To what warm shelter canst thou fly?
I do not fear for thee, though wroth
The tempest rushes through the sky:
For are we not God's children both,
Thou, little sandpiper, and I?

A STORY FOR A CHILD

BY BAYARD TAYLOR

Little one, come to my knee!
Hark, how the rain is pouring
Over the roof, in the pitch-black night,
And the wind in the woods a-roaring!

Hush, my darling, and listen,
Then pay for the story with kisses;
Father was lost in the pitch-black night,
In just such a storm as this is!

High on the lonely mountains,
Where the wild men watched and waited;
Wolves in the forest, and bears in the bush,
And I on my path belated.

The rain and the night together
Came down, and the wind came after,
Bending the props of the pine-tree roof,
And snapping many a rafter.

I crept along in the darkness,
Stunned, and bruised, and blinded,—
Crept to a fir with thick-set boughs,
And a sheltering rock behind it.

There, from the blowing and raining,
Crouching, I sought to hide me:
Something rustled, two green eyes shone,
And a wolf lay down beside me.

Little one, be not frightened;
I and the wolf together,
Side by side, through the long, long night,
Hid from the awful weather.

His wet fur pressed against me;
Each of us warmed the other;
Each of us felt, in the stormy dark,
That beast and man was brother.

And when the falling forest
No longer crashed in warning.
Each of us went from our hiding-place
Forth in the wild, wet morning.

Darling, kiss me for payment!
Hark, how the wind is roaring;
Father's house is a better place
When the stormy rain is pouring!

THE TIGER

BY WILLIAM BLAKE

TIGER, tiger, burning bright
In the forests of the night,
What immortal hand or eye
Could frame thy fearful symmetry?

In what distant deeps or skies
Burned the fire of thine eyes?
On what wings dare he aspire?
What the hand dare seize the fire?

And what shoulder and what art
Could twist the sinews of thy heart?
And, when thy heart began to beat,
What dread hand and what dread feet?

What the hammer? What the chain?
In what furnace was thy brain?
What the anvil? What dread grasp
Dare its deadly terrors clasp?

When the stars threw down their spears
And water'd heaven with their tears,
Did He smile His work to see?
Did He who made the lamb make thee?

Tiger, tiger, burning bright
In the forests of the night,
What immortal hand or eye
Could frame thy fearful symmetry?

"A FAIRYLAND MESSENGER"

PHIL AND THE LITTLE PROFESSOR

THE path through the woods was golden with sunshine, and Phil strolled along with his hands in his pockets, whistling a cheerful tune. The birds were too drowsy to give it a chorus save by a sleepy chirp or two, and even the restless squirrels were dozing.

It was the first day of the summer holidays. An hour ago, and the big red house Phil had just left was thronged with excited schoolboys, rushing hither and thither to the distracted Matron with things they had forgotten to ask her to pack, or shouting directions to Phil concerning the pets they were leaving in his charge. It was a matter of course to them that he should stay behind—he always did, even at Christmas.

"It must be awful to have no home," young Smithers had once remarked.

"My home is everywhere," replied Phil, who knew that wherever he trod he was among friends. Young Smithers had no idea what he meant; for the woodfolk never talked to him, nor the wind as it rustled through the trees.

"I'll be off!" thought Phil, for the silence of the deserted building gave him an odd little lump in his throat. Once in the woods, he forgot to wish that he "belonged" to someone, and his small round face grew merry instead of sad.

His great chum, Brian, had hinted to him several times this term of an invitation to his uncle's, already overflowing with boys and girls. But illness had broken out in the village, "just at the very wrong time," and Brian himself had been shipped off to stay with some cousins whom he scarcely knew.

*From "In the Once Upon a Time," by Lillian Gask; used by special permission of the publishers, George G. Harrap & Company, London, England.

As Phil sauntered over the sun-dappled moss he was thinking of Brian; and he wished that he had remembered to remind him of the museums.

"They must be ripping places," he said to a bright-eyed rabbit, who had recklessly scampered across his feet, and was watching him now from behind a tussock of grass. None of the woodfolk minded Phil—he was almost one of themselves.

The little rabbit cocked his ears, as if waiting to hear more; but before Phil could open his lips again, he suddenly disappeared. The distant thud of an old buck's feet had warned him of coming danger, and his bit of a tail flashed through the brush like a quick puff of smoke.

"Now, who can it be?" Phil said aloud, since visitors to these woods were rare. The rabbit's ears were quicker than his, for Phil heard nothing, and several minutes passed before the figure of a little old man came quickly round a clump of hawthorns.

He was dressed in brown from top to toe—a snuff-brown suit that looked as if it could never have been a new one, with a brown felt hat that had no shape, and brown shoes that were guiltless of polish. His eyes were brown, and his face was brown, and so were the wisps of bushy hair that stuck out like a fringe all around it, though later Phil saw they were streaked with gray. He carried a stick in one thin brown hand, and a battered tin box on a long brown strap was slung over his drooping shoulders.

He did not see Phil till he came quite close to him, when he blinked his twinkling short-sighted eyes, and patted his coat-tails to find his glass.

"I had them a moment ago," he murmured, giving up the coat-tails as hopeless, and groping in his breast pocket. "It's extraordinary — most extraordinary! They vanish when I want them as if they were elves or sprites."

"There are numbers of elves among the ferns," said Phil, more than half in earnest. He still kept a sharp lookout for brownies when the dew was yet sparkling on the grass, and firmly refused to believe that the legends he had read of nymphs and dryads were "all made up."

"I shouldn't be surprised," nodded the little old man, with a whimsical smile that somehow made him look much younger. "There'll be fairies always for you and me, boy—we couldn't do without them. I've met more than one on a summer morning when the birds were singing high in the sky."

He nodded again, and was passing on when he stumbled over a spreading root, and the tin box flew wide open. A shower of beetles fell to the ground, and the liberated prisoners made off in all directions.

"Dear me! Dear me!" sighed the little old man, with more vain attempts to find his glasses. Phil came to the rescue, somewhat reluctantly, for he never liked to think of wriggling insects with pins stuck through their heads.

He was relieved to hear, when some had been recaptured, that they were

only wanted "for observation," and would all be set free next day.

"I'm fond of bettles," said Phil's new friend, as he shut down the lid on his recovered treasures. "I began to study them," he went on, "long before you were thought of, when I was a lad at school. And now I'm old, but I'm learning fresh things about them still. One goes on learning, you know."

"I think it's the jolliest thing one can do—watching insects, and birds, and animals," said Phil. "Often in term time I get up early, long before the other boys in my dormitory are awake. I swarm down the ivy outside our window—the branches are almost as thick as my wrist—and come here by a short cut across the meadow."

"How is it that you are left behind?" asked the little old man. For a learned professor, with any number of letters after his name, he was decidedly inquisitive, and he listened with just the same pleasure to Phil as he might have done to a "grown-up" telling of new discoveries. He was, indeed, a delightful person to talk to; for he never interrupted, and his funny little chuckling laugh was most encouraging.

"Go on," he said, when at last Phil stopped. It was many years now since he had said that to anyone under forty; and he found the study of a real live boy even more interesting than that of beetles.

"I'm not 'lonely,' exactly," he explained, in answer to another question from his companion, "though sometimes it's rather dull. I'm quite used, you see, to being left at school—there's nowhere for me to go."

The Little Professor made no comment, but by a happy inspiration produced from the pocket that harbored his missing spectacles an apple as wrinkled as himself. It wasn't much to look at, being somewhat speckled and quite off color; but Phil was pleased at this token of friendship, and offered some rather sticky peppermints in return.

"If I were to eat even one of those things, boy," said the Little Professor, eying them darkly, "I shouldn't sleep a wink to-night. Sweetmeats are poisonous at my time of life, though when I was young—ah! how I enjoyed 'em!"

Blissfully unconscious that his remaining beetles were just then engaged in a desperate struggle which threatened to wipe them all out of existence, he launched into a glowing account of certain episodes of his schooldays, when the forbidden delight of making fudge over a gas-jet had filled him with joy.

"And very good fudge it was, too," he said with melancholy pride. "I don't say it wasn't a trifle burned, but that was the fault of the saucepan. The cook—her name was Elizabeth, I remember, and her eyes ran through us like horrid gimlets when she caught us in her pantry—said we'd ruined that saucepan for good and all, and made us buy her another. It took the best part of our pocket money for the rest of the term, but the fudge was worth it. . . . What's that you're looking at? Another bettle?"

They had strolled on together by mutual consent, and Phil had come to a stop beside a thick low bush, parting its boughs so that he might see into the center.

"There's a nest of a shrew down there in the ground," he whispered. "I spied it out the other morning."

"What! the nest of a shrew!" cried the Little Professor. "Where? Let me look, boy!" And down beside Phil he flopped, peering through the bush in his short-sighted way, and muttering to himself.

There was little to see—only a dome-shaped nest of leaves and grass built in a little hollow.

"She must have a brood of young ones," said Phil. "I was sure last time that I heard them squeak. They're the queerest things, baby shrews—all legs and noses. They haven't a scrap of fur when first they're born."

The Professor lifted a thin brown hand, and Phil was only just in time to prevent him from slipping it into the nest where the family slumbered during the day.

"The mother would bite you like anything!" he exclaimed, "and her teeth are as sharp as knives."

"Would she, indeed?" inquired the Little Professor, as though rather grieved at such pugnacity. "I should like to have seen her at close quarters," he went on, as he rose to his feet. "Shrews are said to have existed more than two million years ago, for their remains have been found in some of the deepest layers of the earth's surface which have yet been explored. What do you think of that, eh? They are supposed to have been here long before those strange prehistoric monsters whose fossilized bones are now in the national history museums. Man is quite a newcomer by comparison, though most likely he was here as far back as 400,000 years ago."

"It sounds like a fairy tale," said Phil, his merry eyes growing large and round as he tried to picture what the world was then.

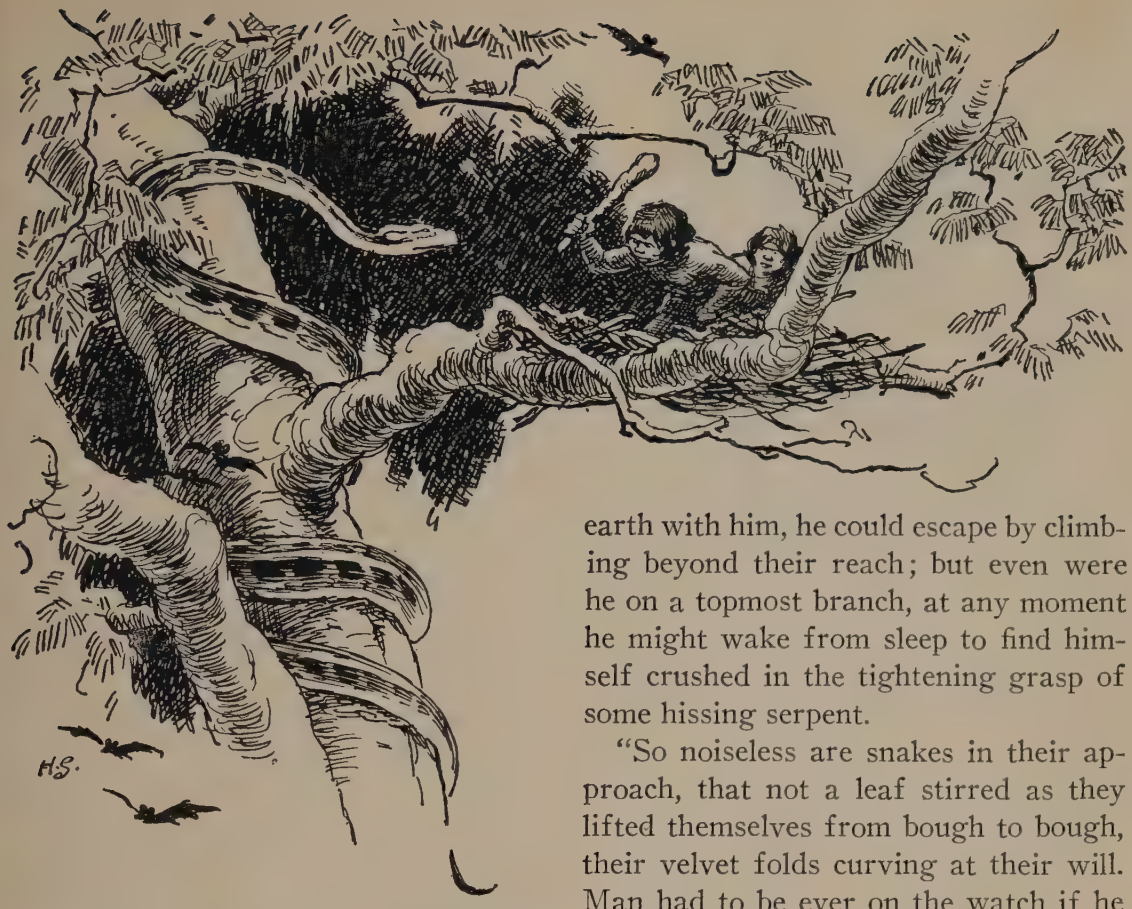
THE TREE MEN

The Little Professor had seated himself on a steep bank beneath a beech tree, and his very short legs were quite off the ground. Seeing this, Phil turned over a lichened stone to make a footstool for him, and a little grass snake, thus robbed of its shelter, darted away through the grass. Its gray-brown skin was tinged with lustrous green, and it looked more beautiful than ugly.

But Phil had started, and drawn back, shuddering; and now his cheeks were reddened with shame.

"I can't tell why," he said, "but snakes always make my flesh creep, even when I know they are perfectly harmless."

The Little Professor looked past him to the glimpses of blue through the leaves overhead.



"Instinct is hard to kill," he said musingly, "even after centuries of our so-called civilization. I should not be surprised if your horror of snakes, which most men share, were due to the dread which protected our far-off ancestors from such creeping things in the days when man lived in the trees."

"Lived in the trees?" echoed Phil incredulously. The Little Professor did not seem to hear him.

"His deadliest enemies," he continued, "were then the great serpents which reared themselves among giant tree ferns, creeping upon him unawares. From other creatures which shared the earth with him, he could escape by climbing beyond their reach; but even were he on a topmost branch, at any moment he might wake from sleep to find himself crushed in the tightening grasp of some hissing serpent.

"So noiseless are snakes in their approach, that not a leaf stirred as they lifted themselves from bough to bough, their velvet folds curving at their will. Man had to be ever on the watch if he were to escape them, and the sight of such a terrible foe might well fill his heart with fear. This horror of snakes would most probably be born as an instinct in his children, and would persist through the ages in his descendants, even when man made his home no more with the birds, and had no need for such protecting fear."

"I can scarcely believe men once lived in trees, like the thrushes and squirrels!" said Phil incredulously.

"But they did!" the Little Professor nodded. "And it is wonderful to think how much we have been able to find out about our early ancestors, once our feet

were set in the right way. You will no doubt hear more about these as you grow older, boy; and if you remember that nothing has happened, or ever can happen, save by the will of God, you need not fear where increasing knowledge will lead you."

The green aisles of the wood were darkening now, and the Little Professor deserted the bank, to walk on with his arm through Phil's. There was not much difference in height between them, for Phil was tall for his age, and the Little Professor was growing down. He had reached the other side of the hill, while Phil had still to climb it.

"Tell me about when men lived up in the trees," urged Phil, as the interlaced boughs of the arches above them parted to show the twilight sky.

"They are the first men of whom we can have any clear idea," said the Little Professor. "What those who came before were like we can only imagine.

"Though you and I would call these tree-dwellers 'savages,' they were really most wonderful beings as compared with the beasts among which they found themselves. They could only live by using their wits; for on every side of them were enemies, and none of them knew how soon he might be destroyed. Some of their food they found in the trees; delicious honey from the wild bees' hives, birds' eggs, and birds, and tender young squirrels. But when they left the shelter of the boughs to dig roots or hunt small mammals, or to drink at some rocky pool, there were cave lions and bears and prowling tigers to pounce upon them and devour them, and herds of rhinoceroses and mammoth elephants to trample them underfoot.

"Think how nimble they must have been to get out of the way of these! Since they had not yet learned to help each other, most of them lived by themselves, instead of in little groups or communities, as they did later. In the long dark nights, when they heard the cries of the prowling beasts who roamed the underworld of the forests, far down below them, they must have been full of fears. Tree-mothers alone had company, for of course they always took care of their babies until these were big enough to do without them."

"Of course!" said Phil, with a sigh so small that the Little Professor did not hear it. But a soft breeze ruffled his sleek dark hair, and a sleepy thrush gave him an encouraging "tweet" as he passed beneath her nest.

"The first cradle was no doubt a cling-

ing vine," the Little Professor continued. "Most likely the tree-woman twisted one round her waist or shoulders, forming a sort of hood in which she could put her baby to sleep, and so have her hands quite free. She needed these, you see, to help her climb from one bough to another or to swing herself up out of the way of harm. On some of the trees there would be no vines, and then when dusk came, she would break off slender boughs and leaves, and make a nest for him, as the birds do, sleeping close beside him so that she might be near when he awoke.

"Everything that she had learned in the way of protecting herself she taught her little one, talking to him in the mother-language that all babies understand. He learned not to gurgle or crow with delight when he saw the sparkling waters of the running stream to which she took him to drink, but to be quite quiet, lest some fierce animal hiding in the thicket might hear his voice and spring out on him. When he could walk on the ground, as well as climb with her from bough to bough, you may be sure she told him not to venture far from the sheltering trees until he had first made certain that no enemy was near, and if danger threatened from the passing of some wild beast, she urged him to hunch himself up on some leafy bough and not stir a finger until he was sure it had gone. If the wind were not blowing his scent toward it, he would thus be safe; for his sun-tanned body would scarcely show against the bark of the tree, even if this were leafless.

"Many of Nature's children, both great and small, protect themselves in this way still, and those to whom she has given neither teeth nor claws as weapons of defense are often so like the color of the favorite resting-places that when they don't move they are almost invisible."

"We do that sort of thing when we're scouting," nodded Phil. "The other day Rollinson was as near as possible being caught by the enemy as he carried his dispatches over the side of Ferry

Hill. But he threw himself flat on the ground, hid his head under his arms, and lay there like a log without moving a muscle. His brown suit looked the color of the ground, you know, and young Davis passed by without seeing him."

"Good for Rollinson!" said the Little Professor. "He was using his wits, as the tree-boy did before him. But neither you nor I might be here now if our early forefathers had not learned how to turn one of the most powerful forces of Nature to their own use; since by so doing they obtained an enormous advantage over all brute beasts. The conquest of fire marked a new era in the history of man."

"How?" asked Phil, but the Little Professor had stopped, as if to say good-night. They had come to the end of the woodland path, where the road branched off to the village, and the pale silver crescent of a rather watery moon shone faintly over the hill.

"I'll tell you some other time," smiled the little man. "It's getting late, boy, and I'm tired. Besides, I want to sort out those beetles—I've a fancy that I shall find a new one somewhere among them. We're sure to meet in the woods again, and then we'll have another talk."

WHEN Phil awoke next morning it was raining, as if it meant to go on forever. He looked out ruefully at the sodden lawn, and beyond it to the pools that flooded the path between the lilies. They were bent and battered to the ground, their golden centers smirched with mold.

"I sha'n't meet that queer little man in the woods to-day," he sighed, for the sullen gray clouds that banked the sky gave no sign of the sun that hid behind them. Only the faintest of twitterings came from trim box hedges of clustering ivy; even the sparrows were subdued, while blackbirds and thrushes tucked their heads under the wings and hoped for brighter times.

All that day it rained, and the next, and the next. Phil entreated in vain to be allowed to go out, for the Matron was most emphatic in her *"No!"* So he amused himself by building a fine new rabbit hutch to gladden Brown's heart on his return; and as he sawed, and planed, and hammered, his thoughts were far back down the ages, with the men who had lived in the trees.

On the fourth day, when the hutch was finished, and he had started on a bookshelf for the Matron's room, a small glint of blue appeared in the sky, and the steady patter of raindrops ceased. Some brooding clouds in the southwest hinted that there were more to follow, but Phil did not wait to think of this as he ran for his cap and leaped over the pools.

"It's a ripping day!" he cried, pushing aside the ferns before the mouth of a small cave in the side of a disused quarry. This was a favorite haunt of his, for beneath it his friends the rabbits had tunneled a flourishing warren, and he liked to see them pop their heads out when he kept very still.

No bright eyes peeped at him to-day, however, from either entrance to the warren, for someone else was in the cave. Sitting cross-legged on the ground, and looking remarkably like a benign brown dwarf, the Little Professor watched a fat green beetle trying to creep up and over a barrier of stones which he had raised all round it.

"There! He's off! I knew you would disturb him!"

And the Little Professor looked almost cross, but only for a moment.

"I daresay I shall find another," he said, as if to console himself. "Some of his kind frequent the trees, and—"

"I'm sure they're most awfully interesting," said Phil, dreading lest he might have to listen to a long description of their habits. "But so were those tree-men you told me about the other day. I've been thinking of them ever since."

"Have you, now?" asked the Little Professor, blinking at him with mild

approval. "What's your name, by the way, boy? 'Phil'? Ah! I remember. . . . Yes, they were wonderful creatures, our tree-men ancestors, and we've not found traces of any other animal who can have come near them in point of intelligence, judging from the size and shape of even the earliest skulls which have been discovered. We call primitive man a 'savage' nowadays; for he ate his food raw, and fought as a wild beast when need be. But all the knowledge we possess today we owe in its beginning to the tree-dwellers and the cave-men, who used their wits that they might live, and overcome their enemies. . . . Hallo! There's the rain again!"

It was coming down now in blinding sheets, so that even the sturdy ferns bent beneath its weight. A tiny stream trickled through the mouth of the cave, to be sucked in greedily by the thirsty ground, and the Little Professor turned up the collar of his coat, and tucked his toes well under him.

"Tell me what happened to those tree-babies," suggested Phil, who had been amused to think of them rocked to sleep by the wind in their vine cradles.

"They would have things much their own way while they were small," mused the Little Professor, "for Nature makes all mothers on the same pattern, and they would rather die than let their young go without food and shelter, or come to harm. But when the tree-boy was old enough to find food for himself, he would wander away, for now there was probably another baby to claim his mother's care. Not until after the days of tree-dwellers did men live in family groups.

"So one summer morning, off he'd go. He would swing himself from bough to bough as nimbly as a monkey, and most of his time he would frisk and frolic in the giant trees, where he felt quite safe. If there were serpents in his part of the globe, he kept a sharp lookout for them; and well he knew that in the 'under-world' of the forest were prowling beasts of prey.

"But in spite of the dangers that beset him, I think that the tree-boy had a jolly time. He loved to feel the warm soft rain come pattering down on his bare skin, and the sun seemed to him as some great father, who smiled down kindly.

"And, like all boys, he loved adventures, and finding out things for himself—as no doubt you do! Eh?"

"I ran away to the woods," said Phil, "when I was quite a little chap. And I found out, oh, such heaps of secrets before I went back to people again. I lived with the wood things, you see, and they taught me all they knew."

"They taught the tree-boy, too," returned the Little Professor, "though perhaps not exactly as they taught you, since your needs are different.

"Most likely he wandered farther than his mother had done, and on one of his journeyings came across a herd of wild pigs with tusks. The first thing he'd notice was that they dug in

the ground for food, and grunted with delight when they rooted up queer little black things — truffles — which they seemed to enjoy immensely.

"So he dug also, and found truffles so good that he hurried back to his old haunts to tell his mother all about them. He was so disappointed when he could not find her that his eyes smarted, and a queer choky feeling came into his throat. She had gone, and he felt very lonely; but the woodfolk kept him company as they did you, and every day he learned something from them.

"If his mother hadn't shown him how to build a snug little shelter to sleep in on bitter nights—and we know that tree-men existed when the earth was very cold—he would learn this from some canny old squirrel who knew well how to make himself comfortable.

"'Look at me!' Father Brighteyes would chatter, as he took a leap into a heap of rubbish which he had piled in the fork of two meeting boughs, burying himself in the midst, and working away from the inside.

"Then the tree-boy heaped up dry fern and moss in the fork of two larger boughs, and dived into this as the squirrel had done, shaping it round him so that he was completely covered, while leaving a hole in the side through which he could breathe.

"Very likely it was the monkeys—if there were any in this forest—who first taught him to look before he leaped, as all sensible people should. When they frolicked among the branches, he would see how carefully the leader of a troop tested a doubtful bough before

he trusted his weight to it, watched by all the rest; and he himself would be equally cautious not to risk a fall.

"And just as the birds and animals 'increase their range,' as we call it, and gradually go farther and farther from their first haunts, though they often return to these again, so, as his limbs grew strong and he became more fearless, would the tree-boy extend his wanderings. Up to now he had probably been content with such food as honey and eggs, sweet roots and berries, with the new-found dainty of truffles. But the more he explored, the more hungry he grew; and when, one day, he saw some larger animal pounce on a fine fat hog and devour it, the next thing would be for him to catch a piggy for himself, by chasing it down the forest glade. Having killed it, he'd eat a portion of it then and there, and find it good; and from this day on he would hunt small animals when he was hungry."

"But I thought you said the first tree-men had no fires!" Phil exclaimed. "Did he eat things raw?"

"How else?" asked the Little Professor. "And as he had neither a knife nor a fork, what he couldn't bite with his teeth, he tore.

"But presently he found a better way than this. When digging for roots, which he still ate, he would come across the teeth of dead animals left in the soil, though their bodies had crumbled away; and these would be his first 'knives and forks.' The two huge fangs of the saber-toothed tiger—a fearful beast which lay ever in wait for him, and was much more alarming than tigers are now—would put it into his head to use the teeth and claws of dead animals to divide up the flesh of his game; and no doubt he used sharp-pointed sticks also, though these would not help him so much.

"Later on, when tree-men had learned to think still more, it flashed into the mind of one who was perhaps quicker-witted than the rest that with a big stick to help him, he could kill much larger animals, and so have more to eat; not only this, but that he could so defend himself more readily if they, or some envious fellow tree-man, attempted to attack him. This was a great discovery, for until now his only weapons must have been his hands. He used both equally, the left or the right, just which came easier to him

at the time; and wise men tell us that if we did this now, we should get on with our work much faster, and better, too, since then both sides of our brain would be equally developed, as Nature meant they should.

"He kept the club beside him while he slept, in case someone else took a fancy to his shelter and attempted to put him out. After a time our tree-man most likely tried to use it for cracking nuts; strong as his big teeth were, you see, he sometimes found nuts too tough for them. When he saw that the club had no effect, he tried a stone, and now the nutshell fell apart.

"This was the very first hammer, Phil; and the earliest tools that we can trace are just such stones, marked and dented thousands of years ago by the uses to which they were put. To look at, they seem but children's playthings; but in one sense they are far more interesting than the most exquisite bit of modern workmanship in finely polished steel. He had begun to make use of things outside himself, to take possession of those which have no 'life,' as we know it, to minister to his needs."

"Guessing how men learned to use things is most awfully interesting," Phil said slowly, wrinkling up his forehead until it looked as crumpled as the Little Professor's. "We seem to know such a lot without having to think very hard about it—I wonder why?"

"It's the knowledge of those who came before us," nodded the Little Professor, puffing blue circles of smoke all round his head until he looked like some Eastern genii. He had found his pipe after much vain searching, and actually his matches, too.

"Just as that tree-boy we spoke of knew all that his parents knew," he went on presently. "When he, in his turn, became a man, and managed to persuade a woman that he was worth loving, his children would be taught and shown not only what his mother had taught him, but all that he had discovered for himself. This 'passing on' of knowledge has continued down the ages; and will go on till the end of the world.

"As you said just now, we know so much without having to learn it for ourselves, and that is one of the reasons why, if we mean to be 'men' at all, we must do still better than those who made our opportunities for us, since we have so much more in our favor. The progress of the race is in

our hands, boy, and what's to come depends upon you and me.

"But to come back to our tree-man. In the course of time, as his brain grew bigger by being used, his hands grew more skillful, just as his vision grew more keen, and he began to fashion more tools and weapons. It occurred to him before very long to knock off a sharp bit of flint from a stone by striking this with another, and here was a knife which was a great improvement on the biggest teeth he could find. By leaving one end of the flint unchipped, he made a handle; and now he could hunt still larger creatures, since his knife, like his club, was a weapon both for attack and defense, only far more powerful. He would use it whenever he wanted a change of food, which he still ate raw; for he had not yet mastered that great force which was to change the course of life for him.

"So time went on; many generations came and went, and only the hardiest tree-men survived the increasing coldness of the climate as the mountains became covered with sharp-peaked glaciers, and the earth was ice-bound for months at a time. The caves in which they might have found refuge from the bitter winds were the lairs of wild beasts, and to enter them would have been to court a terrible death.

"But at last man won the blessing of fire, and then, indeed, was he 'king of the beasts.' . . . Phew! I wish we could light a fire at this moment—it has turned as chilly as November, and we can't cross the fields in such a deluge."

Phil went to the far end of the cave, and brought out an armful of dry ferns.

"Sit on this," he said briskly, "and I'll fetch some more to put on the top of you. It will keep you as warm as toast." Phil brought another heap for himself, and the tiger beetle, thinking the coast quite clear, came out from behind the stone where he had hidden himself, and opened and closed his wings.

WHEN MAN FOUND FIRE

"How glad the tree-man must have been when first he had a fire," said Phil.

"It was the most splendid thing that had ever happened to him!" agreed the Little Professor. "He cherished the burning brands he had snatched from some fire which the sun had lighted as he had cherished nothing before; for not only did fire bring him warmth and comfort, and make many things possible which he had not been able to attempt, but it helped him to defy the savage beasts from which he had been in hourly peril.

"They were even more frightened than he of its hungry flames; and when he found they would not come near it, he forsook the trees, where he had been beaten and buffeted by wind and rain, or cramped with cold when the

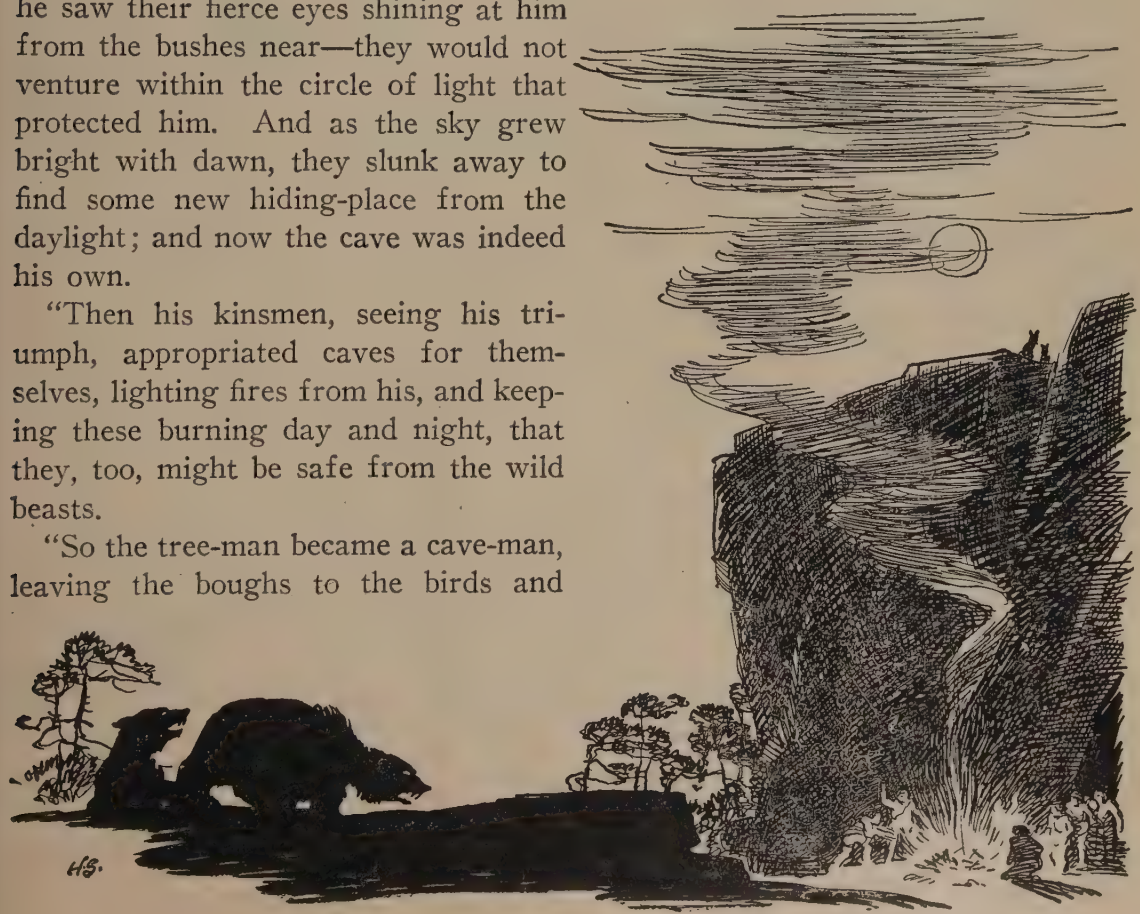
boughs were white with frost, and took a snug cave. He drove away the angry creatures whose lair it had been by building a fire outside the entrance, when they left the cave at dusk to seek their prey.

"He kept this fire alight, as he had done the first, by throwing on more sticks as it shrank downward, half believing it to be some living monster who fed on dry wood. So long as the bright flames crackled and roared, he knew that he was safe from the bears or hyenas whose cave he had made his own; for though they might prowl round in the darkness—and sometimes he saw their fierce eyes shining at him from the bushes near—they would not venture within the circle of light that protected him. And as the sky grew bright with dawn, they slunk away to find some new hiding-place from the daylight; and now the cave was indeed his own.

"Then his kinsmen, seeing his triumph, appropriated caves for themselves, lighting fires from his, and keeping these burning day and night, that they, too, might be safe from the wild beasts.

"So the tree-man became a cave-man, leaving the boughs to the birds and squirrels; and what is called 'group life' began.

"Instead of going away by herself, his mate stayed with him when the children came; and very soon—perhaps quite at first—more than one family began to live in the same cave; as many as it would hold. The cave-men found there was safety in numbers, and so they formed themselves into 'clans'—large companies in which the men hunted together and shared the spoil, which their women cooked in the ashes of the fire that it was their duty to keep alight. Besides this, they dug in



the ground for roots, and went out in parties to gather berries, and to add to their store of nuts. The children, who played in the dark recesses of the cave, and made toys for themselves of the whitening bones of the long-dead animals whose home it had been in days gone by, brought in pine needles and dry fern from the forest, and small boughs of leaves to sleep on. And no doubt their mothers tucked them up as tenderly as yours did you.

"Each clan of cave-men had a name; that of a bird, or an animal, or something in nature that had happened to strike their fancy; and this name belonged to every member of the clan. A man of the 'Tiger' clan was a 'Tiger,' and a man of the 'Reindeer' clan a 'Reindeer,' and so on, whatever the name or 'totem' of that clan might be."

"Why, we've 'clans' like that in the Boy Scouts!" cried Phil, his gray eyes opening wide. "I belong to the Wolves, and so does Brian. Fancy cave-men doing as we do!"

"It is you who are doing what the cave-men did," laughed the Little Professor. "As the cave-men sat around their fire after a long day's hunting, their limbs stretched out in its welcome warmth, and the savory smell of roast meat in their nostrils, they would plan fresh means of strengthening their rough weapons, and of adding to the number of their tools. By now they

probably clothed themselves and their children in the skins of the larger beasts they killed, for as the climate grew colder and colder they needed all the warmth they could obtain."

"What happened if their fires went out?" asked Phil.

"They would have to beg a fagot from other cave-men, who had been more prudent, and kept theirs burning. Sometimes this meant traveling a long distance, and facing perils from wild beasts in unknown territories. It was a great day for all the cave folks when one of their number discovered that fire could be 'made' at will.

" 'How did he find this out?' By accident, I expect; for it is in this way most great discoveries are born. Perhaps when shaping a flint into a stone knife, he noticed how a tiny spark flew out when two pieces of flint were struck sharply one on the other. Or he may have amused himself while resting under the trees by rubbing two dry pieces of wood together, as idly as Newton watched that rosy apple which taught him by its fall the law of gravitation. As the hunter's fingers moved to and fro, there would come, if he rubbed long enough, a thin little flash of light; he'd sit upright and go on rubbing the sticks together, to see if this would happen again.

"Can't you imagine his joy and excitement when he found that 'fire,' this wonderful thing that warmed and protected him and his children, and yet

ravaged the plains as if it were a beast itself, would actually spring into life before him at the bidding of his hands? Once he realized this, the next thing would be to catch the spark on a wisp of dry grass, and the next to light fires where and when he willed.

"And so man made another step as 'lord of creation'; for fire has been at the beginning of almost every art and invention known. The marvels of steam and electricity, the great iron dreadnaughts and the aerial warships all were made possible through man's conquest and use of fire."

"Did all early men make fire in the same way?" he said with a start, echoing Phil's question. "Why, of course not, boy. There are different ways of doing things in every part of the world; some men find out things in one fashion, some in another; and there are primitive races who make fire now as they have done from time unknown. The savages of New Zealand and the Sandwich Islands, for instance, still do this by twirling a stick quickly backward and forward on another, a grooved one, placed on the ground; in China, some of the natives strike two pieces of bamboo violently together, while an ancient Mexican painting shows the use of a fire drill—that is, a stick turned rapidly between the two hands, and at the same time pressed firmly down into a small cavity hollowed out in a piece of dry wood. 'Fire drills' are still employed by the savage Veddas of Ceylon, as well as in some southern parts of India and America. The famous Iroquois tribe has always used what is called the 'pump drill,' and the Sioux and Canadian Indians the 'bow drill'—both of these are modifications of the earliest kind of drill.

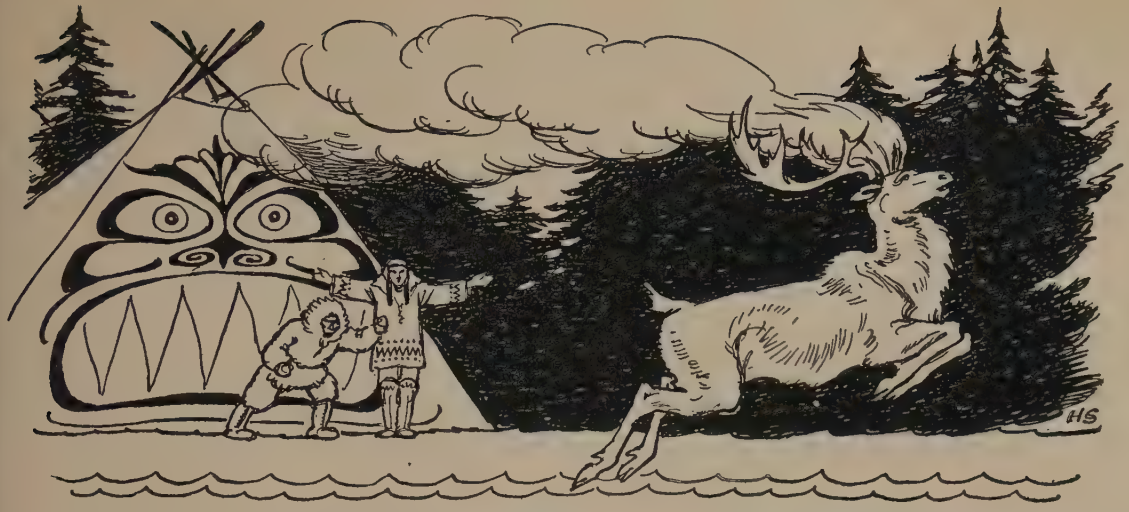
"Among the folk-lore of savage tribes, legends innumerable cluster round the coming of fire; some curious, some beautiful, and most pointing to the belief that fire, in the first instance, was 'stolen.' This belief, perhaps, arose from the old idea that to produce a spark from a stick or a stone was to rob it of its virtue, by taking away something which it possessed.

"A 'saga' from northwest America tells of a fair and mysterious maiden who could shoot so well with her bow and arrow that she was never known to miss her aim, and could bring down the swiftest bird on the wing. She was fonder of sleeping than of hunting, however, and her dreams were so sweet that too often she would pass from one into another, so that the twang of her bowstring was seldom heard.

"One day, when there was a great storm, and the center of the ocean was churned into a mighty whirlpool, her father roughly awoke her.

" 'I am chilly,' he said. 'My bones are old, and the air is so keen that my flesh quivers. Take thou thy bow, and shoot at the heart of the whirlpool; for a voice within me tells that the sticks of wood which float thereon contain the heat of the gracious sun.'

"Reluctantly shaking off her slumber, the maiden did as he bade her. And



as her arrow touched the water the sticks it displaced sprang back to the shore, and lay at the old man's feet. Then the sun came out, and dried the sticks, so that when the old man rubbed them together, behold! fire came.

"And he rejoiced, for now he need dread the blast of the wind no more.

"But his happiness was spoiled by his fear that someone would steal his fire, for he had not learned that in sharing our gifts, we enjoy them twice. So he built a strong house with a terrible door, which had jaws like those of some wild beast, and killed all who tried to enter.

"And the rest of his tribe sighed in vain for fire, till a great stag offered to fetch it for them.

" 'Thou wilt but be snapped in two, like the rest!' sighed the women sadly, But the stag was not afraid.

"He went to the forest, and splintered a bough that had a pleasant odor, and was full of resinous juice. The splinters he stuck in the hair of his head, between his antlers, and when this was done to his satisfaction, he lashed two flat-bottomed boats together, covering them with planks, and so made a strong raft. On this he floated, singing and dancing, to the old man's house by the shore; and the maid of the bow and arrows heard the sweetness of his voice, and entreated her father to let him come in.

"While yet he hesitated, the stag had landed, and made as though to enter the door.

"Down clashed its barbed teeth together; but the stag jumped back in the nick of time. Again they unclosed, so that they might catch him; but now he sprang into the room beyond so quickly that he escaped them.

"Approaching the fire, he continued to sing the melody of the wind; and as he sang, he bent his head toward the glowing embers, as if to enjoy their warmth. Soon the resinous splinters

standing forth from his hair were alight at their tips; with one wide bound he leaped through the opening door, and made for his raft, where he was safe.

"For the maiden's heart was so charmed with his singing that she vowed she could find neither bow nor arrow, and in vain did her father command her to shoot. So the stag sailed back with fire to the people, still singing the song of the wind."

"What a queer story!" said Phil.

"Not more 'queer' than others," returned the Little Professor. "The original inhabitants of Australia, for instance, of whom travelers used to say that not even yet had some of them 'found fire,' have a legend which runs in this way.

"At the beginning of the world, a small sharp-nosed animal, called the bandicot, by some magic means became possessed of a burning fagot, which was of a glorious crimson, and threw out heat and light. This he guarded so jealously that the beasts of the field and the birds of the air met in council to consider how to deal with such greed and selfishness. Since he would not share his treasure, they decided it should be taken from him by force; and the hawk and the pigeon, friends for once, agreed to carry out this verdict.

"So the pigeon hid herself in the boughs of a spreading tree, and did not betray her presence by so much as a single 'coo' when at dusk the bandicot brought out his firebrand, and stretched his limbs luxuriously in its warmth. A sudden flutter of her snow-white wings, a sharp, shrill cry from the bandicot, and she had all but carried off the prize. It singed her breast, however, as she rose with it in the air, and the bandicot seized the brand again as she dropped it, and made with it for the river. Since they would not leave him in peace, he thought, none should enjoy its pleasant heat. And with rage in his heart he plunged into the dark waters.

"Now was the turn of the hovering hawk, who had been waiting his opportunity. Darting down, he struck the firebrand from the bandicot's mouth, tossing it with his powerful

wing on to the high and dry bank opposite. The grass blazed up, and the black men, thrusting long pieces of stick into the flames, possessed themselves of the wonderful gift and found it good; as all men have done to this day."

And now the Little Professor uncurled himself from his cramped position, and peered out at the dripping sky.

"Prosy old chap, the rain," he said. "Once he begins to have his say, he never knows when to stop. We'd better be going home, young man, or our friends will think we're lost."

So they set off together to cross the fields.

SOME EARLY HUNTERS

The Little Professor had some writing to do next day, and though he made Phil free of the study, he enjoined upon him that he "mustn't talk."

"I'm trying," he said, "to make something clear to people who are trying not to understand, and that's a very hard task, Phil! Jackson will take you sight-seeing if you'd rather not wait for me—I'm afraid I shan't be ready for two or three hours at least."

It did seem a waste of time to spend even part of the morning indoors, and Phil rather liked the look of Jackson, in spite of his melancholy face. But the weather was anything but inviting; no delicate network of silver frost sparkled now on the Square railings, and the banks of crisp snow at the sides of the road had turned into mud and slush. It was raining, too.

"I think I'll stay at home," said Phil, and taking down "The Old Red Sandstone" from its special place on the shelf, he settled himself by the fire to read. Some of the words were rather hard, and often he longed to question the Little Professor; but the hours passed quickly for all that, and the sound of the lunch gong quite surprised him.

By the time lunch was finished the sky was clear, and the sparrows in the bare Square garden were twittering hopefully. The Little Professor had finished his writing, and was as eager as Phil to be out in the sunshine.

"We'll go to the Zoo!" he cried gayly. And the decorous Jackson was startled to hear Phil shout "Hooray!" as he ran upstairs for his coat.

All he had heard of long-dead animals made live ones more interesting than ever, and he never forgot his first glimpse of the Gardens. As he entered the lion house, the tawny lions and great striped tigers were awaiting their meal, pacing their cages in an ominous silence broken occasionally by rumbling growls which told of growing impatience. Their flaming eyes and fierce bared teeth awoke in him an echo of some bygone fear as one of the hungry brutes glared at him through the bars; they were more dreadful still,

he thought, as they tore the red flesh from the bones that the keepers presently pushed into their cages. And when, their appetites partly satisfied, they roared in unison till the building shook, he pictured the half-naked cavemen of old, tremblingly rejoicing within the circle of their fires that some gentle deer, or other creature of the forest, had been their prey instead of themselves. No wonder men cherished the glowing flames which kept such enemies away!

"I'm glad that lions don't run wild now," he said very soberly to himself. And the Little Professor, astonished at his silence, asked him if he were "all right."

"I'm enjoying it ever so much!" he said, "but what terrible beasts they are! If cave-tigers could open their jaws more widely than that old chap," he added, as a splendid fellow yawned in the face of a very small boy who pointed a chubby pink finger, "I should think they swallowed cave-babies whole!" And once more he was thankful that "millions" of years had come between him and those early men.

The Little Professor and he spent so long in the reptile house, looking at grim crocodiles, and snakes and lizards —the last little creatures quite fascinating Phil, who remembered what lizards had been like in days gone by—that many wonders of the famous Gardens had to be left for another day. There was just time before the gates were closed to visit the elephant house, and they talked of these great beasts again when the Little Professor sat in his big study chair that evening.

"I'm not at all sure," he said, "that the elephant is not the most amazing of living land animals, as he is the largest. He's the only beast, for one thing, who has grown a regular trunk, though there's a fine 'sea-elephant' in the Zoo who has something of the kind himself. And not only is an elephant's trunk furnished with a very delicate organ of touch, with which he can pick up a slender pencil as readily as you could with your fingers, but it serves the purpose of a long and flexible arm, so that he can reach the branches high over his head, and bring down leaves and fruit. His intelligence is developed, too, in a very high degree, and he has a better memory than most men—aye, for a kindness shown to him as well as for an injury. Neither of these does he forget.

"It is difficult to believe when you see him in captivity, led here and there at the bidding of a keeper who looks a mere midget beside him, that once upon a time the elephant was merely a pig-like creature with a snout; and if you saw him in his native wilds, leading his herd like a royal king, you would find it more incredible still. The fossil remains of his humble ancestor were first found in Egypt, in layers of rock laid down long before the dawn of man; and mingled with them were those of sea turtles and sea cows, toothed whales and snakes! In higher layers of rock more fossils of him have been found, but here with bones of

other land mammals, crocodiles, and fossil trees. We guess from this that he lived in the swamps at the mouths of great rivers, being very likely swept away by floods, and buried in the mud.

"You would soon begin to weary if I were to tell you even a few of the many forms through which the elephant passed in his journey down the years; and the names they have given him are enough to scare one—I can scarcely say them myself. But by the skulls and jaws of the primitive elephants we are going to look at to-morrow you'll see how those wonderful tusks of his developed; and, stranger still, how the trunk grew. The soft part of his face, and the bony part of his lower jaw, became slowly longer and longer in the course of thousands of years; then the bony part of the lower jaw gradually disappeared, leaving him with a trunk, as in the early elephant we call the mastodon.

"One of the largest primitive elephants was the mammoth, which was very like the Indian elephant of to-day except for his reddish brown wool and long black hair, and the tassel of hair on his tail. In the time of the cavemen he ranged over the larger part of the northern hemisphere, and many remains of him have been found. A hundred years ago or so the greater part of a mammoth skeleton, the skin still covering the feet and head, was discovered in frozen earth at the foot of the River Lena, most marvelously preserved. It is more than likely that mammoth steak was a favorite dish with early man, for the mammoth and he certainly lived on the earth together. In a cave in France was found a rough picture of this creature engraved on a tusk, a cave-bear engraved upon a stone pebble, and some reindeer engraved upon antlers. Primitive man very soon began to use his hands to express his

thoughts, and that meant that his brain was growing quickly."

"A mammoth seems a huge beast for cave-men to capture," Phil said curiously. "I wonder how they did it?"

"Sometimes, no doubt, he was surrounded when he strayed away from his companions, and waving their torches and yelling wildly, the cave-men drove the terrified monster over the edge of a cliff. But often the mud did their work for them, for the mammoth was so enormously heavy that once he trod in a swamp or morass, down sank his feet, so making him a prisoner. The more he struggled to free himself from the slimy blackness, the more quickly was he engulfed.

"Imagine how the hungry cave-men, who needed much animal food to keep them warm, ran toward the swamp when they heard his trumpet-notes of distress—not to rescue, but to put an end to him with their strongest weapons, and drag him out before he had sunk beyond their reach.

"When they had stripped him of his coat of warm red fur and long black hair—this last formed a heavy mane round his neck—and hacked with their knives through his tough skin, which was twice as thick as that of any elephant to-day, they summoned the rest of the tribe to a great feast.

"Women and children, and hairy-faced men, gathered together round the campfire. They ate until they could eat no more; and then they told stories, and danced and sang till they dropped to sleep on the ground. When they awoke they feasted again, and told more stories, and danced, and slept. This went on for several days and nights; then they divided what flesh was left, and the women carried it home."

"The women?" cried Phil, with a broad smile; for the matron at school, with whom he was a special favorite, had often impressed upon him that in olden times the men were always chivalrous. "What lazy chaps those cave-men must have been!" he cried. "Fancy letting their wives do that!"

"Don't be so ready to judge, my boy," said the Little Professor, smiling back quite as broadly. "If you use your brains, you'll see that if the men were laden they would not have been free to protect their wives and children if some savage beast pounced out upon them from its hidden lair, or a hostile tribe descended upon them from the hills under cover of the trees, and attempted to seize their spoil. By far the best and wisest thing for them to do was to walk beside their womenfolk with their weapons ready in case of need, and keenly on the watch against surprise. This was no doubt the reason why women were first made burden-bearers, as in some lands they are to the present day. Many an Indian squaw carries her little brown 'papoose' strapped in a kind of wooden cradle to her back; and in much the same way, no doubt, the cave-woman took her baby with her wherever she went.

"But to come back to our ancient hunters. Until some sixty years ago it was doubted whether primitive man

had anything but his fists to fight with in the early days of the mammoth and reindeer. But a clever Frenchman was able to prove from discoveries he made in Europe that man had already chipped knives from flakes of flint, and fashioned sharp-pointed spears; and since then there have been many important 'finds' of primitive tools and weapons. We know what we're looking for now, you see, and that makes a lot of difference.

"There was no dearth of game for early man, and to hunt was the principal business of his life. One of the animals most useful to him was the reindeer, for not only did he eat his flesh, but his hide served him for many other purposes besides helping to keep him warm. In winter the reindeer came down from the steeper heights to the wooded hills below, to feed on grass buried deep in the snow, or on moss that grew on the trunks of trees, and in crevices of the rocks. At the first breath of spring they gathered in great herds to return to their lofty summer homes, where all the year round slopes were covered with snow, and the steel-blue peaks of mountains towered high over deep crevasses.

"Now was the time for the ancient hunters to divide themselves into two companies—one to lie in wait for the lordly reindeer at the head of some mountain pass that they must cross, and the other to hide behind rocks by its entrance, and, by shouting and yelling, drive them quickly along the trail.

"Eager to leave the harsh sounds behind them, the reindeer swiftly pressed on till they came to a bend in the winding path. Then, from the shelter of a belt of firs, sprang out a handful of spear-armed men. More shouts and cries, and a wild stampede, and the green of the fresh young grass was stained, and the blue mountain flowers all crushed and trampled by flying feet. The spears of the cave-men had done their work, and the women waiting in the valley below were summoned to come and bear home the flesh.

"To hunt wild horses was more exciting still. The beautiful things were so winged with speed that the fleetest cave-men were no match for them, and

even those wounded by well-thrown spears could run far more swiftly than they. The chase often lasted from dawn to dusk, and when it ended, the hunters were stiff and weary. As the shadows grew long and the dew fell, the cave-men rested beside their slain; and once more the women of the tribe were summoned to do their share of the work. So they skinned the bodies and cut up the meat, and bore this home as they had done that of the mammoth. The tired-out men carried only the horses' heads, which they kept as trophies."

The Little Professor had to stop now, for Jackson appeared to say, "Dinner is served, sir!" and the cook would have been put out if her soup or fish had been left to grow cold.

MAN'S EARLY DREAMS

"It's most awfully interesting to try to guess what those men in the Stone Age thought," said Phil. "They told us at school once that even now there are people who say their prayers to the sun. And I wasn't very surprised, somehow, for he seems so big and strong and mighty, specially when he comes in the early morning and turns all the dark to light!"

"There have been 'sun-worshipers' from the earliest days that we can trace in history, Phil, and on the most ancient of the mummy cases in the British Museum are pictures of 'Ra, the Sun,' sailing in a boat through the upper and lower regions. Every morning the Hindu priests still turn their faces to the east, and with outstretched hands pray that the Sun may 'rouse their minds.'

"The moon has often been worshiped too; sometimes she is called the sister of the sun, sometimes his wife; and primitive forest tribes to the present day hold festivals when she is at her full, and dance all night in her silver light. When silver was found it was supposed to be her personal metal, and you'll find remnants of this old superstition in the way people have in country districts of 'turning their silver' at the new moon. The sun and moon are the only two of the old nature gods that are worshiped still—that is, so far as we know.

"There are tribes living yet of whose inner thoughts we can really tell very little. You and I don't always care to talk to strangers about the things that touch us deeply; and black or white, or yellow or brown, human nature's much the same. Man loves and hopes, despairs and hates, in every clime and in every country; and you and I would be every whit as forlorn without something stronger than ourselves to rest on as was the man in days of old, who found enemies waiting for him behind every bush."

They were passing a clump of thick trees now, and Phil's quick eyes caught sight of the whisking tail of a wide-awake rabbit, who had left his burrow

to see what the day was like. Birds chirped to each other in the leafless boughs, for the air was as balmy as spring. Phil's thoughts came back to the happy present as he looked for more signs of life around him; but the Little Professor's, as was their wont, lingered still in the past.

"Do you remember," he went on after a short silence, "what I told you about the finding of that young man's skeleton in a deep cave at the foot of a chalk cliff? How the position of the dagger beneath his hand, the placing of his body in a certain position, and the burned bones of oxen strewn around showed that even then—and 'then' is not less than 400,000 years, we're told! —men buried their dead with certain rites, and thought death was only a sleep? There are primitive tribes to-day who not only bury weapons and tools beside their 'sleeping' friend, but food and drink, and even changes of clothing. They do so, they explain to the white man who wins their confidence, so that the spirits of the dead warriors may not feel hunger or thirst or cold, or be at a loss should an enemy attack them, when they reach the other side. And we guess from this that when early man laid food and weapons in his friends' rough tombs, his reasons were the same.

"Away in Africa, where Livingstone spent so many years of his life, numberless tribes are 'uncivilized still,' and the Hausas to-day hang queer little gifts on the boughs of the spreading tree in whose shade they have buried someone they love—quaint little wooden carvings which they think will please him, and gourd skins, or calabashes, containing provisions spared from the best they have. And when the wind whispers stories to the trees, or scatters its leaves in a sudden gust, they think that the spirit of their lost friend has come back to speak with them again. They never pass that special tree without sending back their thoughts to him.

"Almost all savage tribes believe as do the natives of Australia—that around them are good and evil spirits, who rule their fortunes as they will, and help or hinder them according as they are pleased or angry. So they are always trying to persuade these 'ghosts' to be their friends; and when a North American savage is paddling his canoe past a dangerous place on the river, he very likely throws something to the river spirit, begging him not to drag him in.

"From ancient drawings on the walls of caves and the brows of cliffs, or deeply engraved on smooth stones and pebbles, we know that the men of dim and distant ages thought in much the same way as these men do now. No doubt to them also the winds and the sea, and the sun and the rain, were friends or enemies, as the case might be. The sea was a monster who was always hungry, and lay in wait to devour men; and the sun was a proud and splendid lord who climbed the sky every day at dawn, and hid himself in the flowing garments of Great-Woman Night when the long day was done. And the wild west wind was a fleet-footed warrior, whom the gods

could not catch to shut up in a cavern, though they sometimes imprisoned the other winds. The west wind, you know, blows very often, and this is why they came to imagine that he had more freedom than his brothers."

"I like those old stories," Phil said dreamily. "I sometimes think I hear the wind speak myself. And fire tells no end of tales when it crackles up the chimney, and the stream that runs through the Heron Woods sings regular songs."

"When I was a boy," said the Professor, "I often wondered why some trees were green the whole year round, though the rest waved their boughs, all stripped and leafless, against the winter sky. And there's a legend handed down among savage tribes which explains this very quaintly.

"A poor little bird, they say, who had broken her wing and could fly not more than a few feet or so at a time, was overtaken by the chill mists of autumn before she could make her way to a sunnier clime when the joys of summer were over. She had lost her mate, and was very desolate—all alone in a big cold world.

" 'I will ask a kind tree to shelter me!' she twittered when at last she found herself near a forest.

"And one after the other she besought the oak, and the birch, and the drooping willow to let her rest awhile. But one and all refused her scornfully —no strange bird should roost in their branches, they said. She must go back to the land whence she came.

"But a friendly spruce took pity on the lonely little creature, and bade her rest on his thickest bough, where the cold blast could not nip her. And a kindly pine who dwelt close by promised to shelter her when the boisterous north wind rushed down upon them from the mountains. And a gay little juniper offered her his berries. 'You are welcome to as many as you want!' he said. The little bird thanked them all, and when twilight fell over vale and hill she sang so sweetly from her grateful heart that the Frost King tarried on his way to listen.

" 'Thou must spare the leaves of the spruce, the fir, and the juniper,' he said to the rough north wind, who besought his permission to strip the forest. 'They alone have shown kindness to the little bird; and while the rest of the trees are stripped and bare they shall be fair to look upon, and ever green.'

"And so it is, for the north wind is the servant of King Frost, and knows better than to disobey."

"The early people who told that story must have been fond of the birds," said Phil.

"And they must have seen that blessings come to the kind and compassionate," added the Little Professor. "There's another legend of a savage race which shows us that primitive men admired the birds as much as we do. It comes from the 'braves' of North America, who have told it from bygone ages round their fires when storm winds raged in the heights.

"One day when summer had flown,"

it runs, "the Great Spirit walked in the forest. The wind sang war songs amid the trees, for they were angry that they might not unloose their wild horses on the sea, where many a little craft was hurrying into shelter. And as the Great Spirit passed down the silent glades, the leaves fell one by one at his feet, so beautiful in their autumn dress that it seemed sad they must decay.

" 'Have pity on our children, Great Spirit,' sighed the trees. 'All through the summer they have made us fair; and we loved them so, and now they leave us!' And the Great Spirit listened, pitying their grief.

" 'They shall live to sing the glory of the woods!' he cried. Then he touched them with his fingers as they fluttered past him; and the red leaves changed into birds with crimson plumage, like flames in the heart of a fire, and the yellow leaves into golden orioles, flashing like sunlight through the glades. But there yet remained a number of brown leaves, which the wind had ravished before the frost had given them gorgeous tints.

" 'I will make these the sweetest songsters of all!' cried the Great Spirit, as they fluttered humbly about his feet.

"And from that time on there have been birds in the forest; and the trees, their mothers, love nothing better than to give them shelter and listen to their nestlings' twitterings."

Phil heard no more legends that afternoon, for the Little Professor was very tired, and his voice had grown quite

husky. They had tea at the top of a tall hotel which looked right down on the winding river, and the rosy and golden lights in the sky were mirrored in it at sunset. In the middle of his third bun Phil suddenly recollected that at this time to-morrow he would be back at school, and the thought made him feel quite sober. There'd be football, and hockey, and Brian, and all the rest; but the holidays would be over and done with; and now it was the Little Professor who would be "left behind."

"What a grand time I've had!" cried Phil. And his companion smiled so gladly that it seemed as though the sun's last ray had stayed behind in his twinkling eyes.

"I've had 'a grand time' too," he said, "and I shall miss you much, boy. But if you won't find it dull, we'll see many more wonders together, all being well, in the days to come. We're only at the very beginning of the fairy tale, you know; and don't forget that you're booked to me for your next holidays."

"Goody!" said Phil, falling back as usual on his favorite word. And though, when they parted on the morrow, the Little Professor's face was wistful, Phil's was bright with hope.

TALKS ABOUT WATER

SOME WATER WONDERS

Once upon a time there was a little Princess who was very fond of reading and learning. But she was not fond of other good things, such as walking, riding, playing games, and running about in the open air.

When she was not at lessons she liked to sit indoors with a book, hiding herself behind the curtains in a deep window-seat. Or she would make up stories and songs and write them out in the exercise-books which she found in the schoolroom cupboard.

Her father and mother were always too busy to attend to her, and her nurses and teachers let her do as she liked.

At last she became ill, and her head ached, and everyone saw that the roses were gone from her cheeks. Then the king's doctor came to look at her.

"Fresh air!" he said. "The Princess must run about, play about, and live out of doors all day; she must do no lessons and read no books for the next six months!"

"Oh, dear!" exclaimed the little Princess, and then she began to cry.

Next day she was taken away from the palace which stood in the midst of the noisy, crowded city, and sent to an old country-house which belonged to the Queen. It had beautiful gardens all round it, and the sea was not far off. Behind the house rose a range of hills and mountains.

THE FAIRY FRIEND

A new friend whom the Princess had never seen before came with her to take care of her. All her teachers were left behind in the city, and the nurses who came had to obey the stranger lady.

The lady was very pretty, and had blue eyes and golden hair; she was not very tall, and could walk and run very lightly. So the little Princess, after looking earnestly at her for a long time, said:

"You look exactly like a fairy. I shall call you Fairy—nothing but Fairy—the whole time we are here!"

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*From "Elementary Science Readers, Book III." Used by special permission of the publishers, W. & R. Chambers, Ltd., Edinburgh, Scotland.

"Very well, Princess," said the lady, with a merry smile. "Perhaps I shall be able to show you Fairyland. Who can tell?"

"Oh, where is Fairyland?" cried the Princess, clasping her hands. "I have read so much about it, and I have tried so hard to see it."

"This is not a bad Fairyland we have here," said her companion, looking round. "We live in a wonderful world.

SHE TRIED TO MAKE HOLES IN THE WATER

Wherever we go we shall find wonders, if only we keep our eyes open to see rightly."

The Princess had washed her hands and called for clean water to rinse them. A nurse stood waiting with a towel, but the little lady seemed in no hurry to use it. She was trying to make holes in the water, but, as fast as her fingers came out, the water closed over the hole and there was no trace left of it.

"Why was this?" she asked the Fairy.

"It is because the particles of water are only loosely held together," said the Fairy.

"Do you mean the drops?" asked the Princess, lifting one hand and letting drop after drop fall from her finger-tips.

"No, they are much smaller than drops; they are such tiny things that your eyes and mine cannot see them. There must be millions of particles in that bowl. They do not take tight hold of each other as the particles of stone do."

"Oh, stone is quite different! A hard, heavy solid thing."

"Your Highness has used the right word. It is a *solid,* and is quite different from water. We could not alter its shape, could we? But water will take any shape that we choose."

"How? Water has no shape at all."

"It has no shape of its own; but it will fit anything, and fill it up just as you please. This water, for instance, has at present the shape of the basin."

"So it has!" said the Princess. "And it is quite still and flat on the top, except when I ruffle it about."

"Here is a pitcher full of water, and if you look in, you will see that the water presses into every curve; it has exactly the shape of the pitcher, and is also quite flat on the top. But if I could suddenly take away the basin and pitcher from the water, would the water still stand up and keep its shape?"

The Princess laughed as she thought what a splash there would be. Then she added:

"But I don't see anything wonderful in that. After all, nurse, I will dry my hands. And now, Fairy, let us go out."

As they went down the great staircase she said: "I have just thought of something. If it were not summertime, we might see water standing alone in the shape of a pitcher or a bottle or a tumbler or anything else. Guess, Fairy."

"I have guessed. It must be ice," said the Fairy, laughing. "Then it turns into a solid. It cannot run about any more, and all its particles are firmly locked together."

"What is it when it is not ice, when it runs about as it does now?"

"We call it a 'liquid.' Here is a whole pond of it," she added, for by this time they were in the open air.

"This is a solid," said the Princess next morning at breakfast, as she dropped a lump of sugar into her cup.

"In one minute your Highness will not be able to say that. Where is the solid now?"

"Where, indeed? It has tumbled to pieces. Why has it done so?"

WHAT HAPPENED TO THE SUGAR

"The milk and water have got in between the particles. The liquid is stronger than the power the particles have of holding together. But it has not destroyed the sugar, of course. I once knew a little girl who used to weep bitterly when her sugar disappeared. She thought it had gone altogether, and

AT BREAKFAST SHE DROPPED A LUMP OF SUGAR IN HER CUP

could not understand why she was not to have any more."

"She must have been a *very* little girl," said the Princess. "Now, I know it is here, because I taste it."

"The whole of the sugar has been taken into the milk and water. It is not quite the same if I pour some water on this bread. What happens now?"

"Nothing happens," said the Princess, going on with her breakfast.

"Nothing very startling, certainly," replied the Fairy, laughing; "but you will see, Princess, that the whole of the water has been sucked up by the bread. The bread is like a sponge."

EXPERIMENTS

After breakfast the Fairy hunted for a piece of brick and soaked it in water; she also found a bit of glass, a

stone, a piece of slate, a lump of soda, and some paper, calico, and flannel.

The Princess played with these things for some time, dipping them in and out

SHE DIPPED THEM IN AND OUT

of a large bowl of water. She was trying which were best able to keep the water out and hold themselves together.

"Glass, stone, and slate," she said, "can keep the water out almost perfectly. Calico and flannel have let the water in and are quite wet, but they hold together.

"Soda has gone all to pieces, but not so quickly as sugar did in my cup at breakfast. The paper has been beaten by the water in quite a shameful way. I am not sure about the brick. I believe there must be water in it, but I cannot squeeze any out."

After this the Princess had her donkey out and went to the seashore. There she saw hundreds of pebbles which had all been made smooth and round by the waves.

So she learned that water has many ways of acting on solid bodies, and was inclined to think that water was the conqueror after all.

ICEBERGS

One of the great enjoyments of the summer was a mountain picnic. Often, when the weather was fine, the Princess and her lady would start early for the hills, the former on her donkey, the latter generally on her own feet. Two or three attendants went also, with shaggy ponies and lunch baskets.

Then followed hours of delight among the pine trees, or on the rocks, or deep in the mountain laurel. One day their guide, a man who looked after the donkey of the Princess, and who knew the mountains well, showed them a new way, a pass between two steep walls of rock.

The Fairy was much interested, stopped, and began to look about very carefully. So the Princess jumped off her steed and followed her.

"This is exciting," said the Fairy, with a beaming face. "I believe a glacier has been here."

She explained to the Princess that the word glacier meant a frozen river, or river of ice. The Princess thought over this for some seconds, and said:

"It sounds absurd, but I suppose I know nothing about it. A river is liquid, and flows; ice is solid, and stands still. And how could a river get up here? Down far below I see the sea. How little boats look; and the fishermen

are only specks. And all the tiny streams are hurrying down as fast as they can to reach the sea. You know we met one as we were coming up. You would have had wet feet, Fairy, if you had not climbed up on the grass. And there, away there on my left, is a proper river, a big, broad one, just going into the sea. But how could there be a river up here?"

"It must have been a long time ago, a very long time ago," said the Fairy.

"Hundreds of years?"

"Thousands, most likely. Things must all have been very different then. There were no laurel, no trees, no flowers; everywhere we should have seen bare rocks covered with snow and ice."

"But how do you know all this?"

"Look at these marks!"

"Scratches on a rock!" exclaimed the Princess.

"And here, and here again, we see more scratches, some very deep, and others quite fine, but all even and regular. I think they are glacier-marks. I have seen scratches like them in places where there are glaciers now."

"Oh, then they have not all perished! Are there really cold, snowy, icy places where nothing grows? I should like to see them—that is, just look at them, and come away at once."

They went on, and were shown some low rocks which were quite smooth and round.

"What do they look like?" the Fairy asked.

"Little domes," said the Princess, "or dish-covers, or teacups turned upside down, or balls, with their lower halves buried in the earth."

"I THINK THEY ARE GLACIER-MARKS"

"They are often called 'sheep-backs,'" the Fairy said, "because, from a distance, they look somewhat like sheep lying down. The ancient glacier passed over these rocks, and wore them down to this shape. You remember, Princess, the smooth round pebbles on the beach?

Ice has even more power than water of grinding, smoothing, and polishing."

Later on the Fairy told the Princess the whole history of a glacier from beginning to end. It was so long a story that some of it was told on one day, and the rest on another.

The beginning was like this:

"On the tops of very high mountains the snow always lies. Summer and winter one may see the white caps on their heads. Every time that fresh snow falls, the heap grows thicker and thicker. Sometimes a great mass of it breaks off and slides down the mountain-slope; but generally the lower snow is gently and gradually squeezed into the valleys below. It does not, however, come creeping down as snow, but as ice."

"Why as ice? How fond things are of changing their shape in your Fairy-land!"

WHY IS SNOW WHITE?

"Very. I must stop a little and explain matters. Snow looks white because there is so much air between its crystals. When a child squeezes a handful of snow into a snowball, some of this air is pressed out, and the crystals cling to each other, and the ball becomes very hard. If it could be squeezed a great deal harder than a hand can squeeze it, it would become ice, or very nearly ice.

"It is in this way that the snow at the lower part of the heap on the mountain-top becomes more and more like ice. Every time there is a fresh snowfall, the snow at the bottom is pressed down more tightly. Then there is always a little thaw when the sun shines, and the water always turns again into ice; and so it comes to pass in one way or another that the loose white snow which fell on the peak comes down at last into the valleys as solid ice."

"Is this the glacier?"

"It is, my Princess. It moves because it is pushed from above by more and more snow and ice, and also because it is on a downward slope, and everything that has weight wants to come down."

ICE-RIVERS

"And does it flow along like a river, or hurry like one of these mountain-rills?"

"No, it is too hard and heavy for that. It does not look as if it moved at all. At the very utmost, it gets along only a yard or two each day; generally, only a few inches!"

The Fairy went on: "In this way the glacier comes slowly down, grinding and scraping the rocks underneath it and at its sides."

"Now I understand about the marks and the sheep-backs!"

"The ice-river does something else. It carries down stones and pieces of rock that have fallen upon it, sometimes very large and heavy pieces; and they arrange themselves as they are borne along in two rows, one at each side of the glacier. It sometimes happens that two glaciers join, just as two streams join, and then the two inner rows be-

come one. Let us make two glaciers here on the grass with some little stones, and then you will see exactly what I mean."

"You make one, Fairy, and I will make the other. What a number of stones we want! Now, I have made one of my rows; now the others. Where are we going to join?"

"My glacier is coming along. Here it is! Now the two have become one. But what about my inner rows of stones, and your inner row, Princess?"

"They also have become one! Let us go on with our glacier. I see, I see! The two rows that have joined will now come along the middle of the glacier."

"So, Princess, if you were out for a walk and met a glacier——"

"How funny you are, Fairy!"

"And it had a line of stones on one side, and a line on the other, and a line in the middle, you would instantly know that it had once been two separate glaciers."

"Of course I should!" said the Princess.

"Besides carrying stones on its back," the Fairy went on, "the ice-river wears fragments off the rocks and grinds them into fine gravel, sand, and mud. There is always a little water at the very bottom of the glacier, and this water takes the gravel, sand, and mud along with it, and makes them polish the rocky floor over which they go. The large stones scratch furrows such as we saw up on the mountains, and the fine sand scrubs and polishes.

"When the glacier at last reaches the lower lands where the weather is always warmer, it begins to melt, and the water that is under it comes out, not clear like a spring, but thick and muddy. It drops its sand and gravel, however, as it goes; it flows on, and, if joined by other streams, may become a fine river."

"THE TWO INNER ROWS HAVE BECOME ONE"

"And what becomes of the row of stones and rocks?" asked the Princess. "The river cannot carry them."

"The glacier tumbles them out upon the earth. I have seen the place where a glacier ended. A heap of stones and rubbish lay across it. They could go no farther, and the glacier was continually bringing more. I suppose you understand, Princess, that the glacier would come down lower if only the climate would let it? There are countries in the far north where the glaciers do come down right to the very edge of the sea."

"Then I know what happens. They roll into the sea."

"Pieces break off and fall in, and these we call icebergs."

"I thought icebergs were very large."

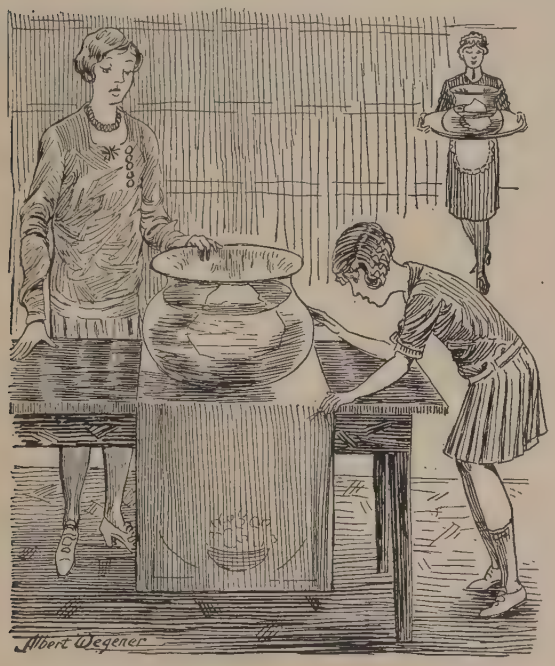
"So they are. When I spoke of pieces of the glacier I did not mean little pieces. An iceberg is a great mass of ice, a rock, a floating hill. It sails away, carrying with it stones and rocky fragments, and, sometimes, such creatures as polar bears."

"How do they get there?"

"The poor things think they are on firm land, and then the iceberg moves and they are taken out to sea, and are perhaps starved or drowned. Or they may be cast on some island far from their old home.

"I wonder if there is any ice in the refrigerator to-day!"

"Why, Fairy, do you want any?"



THE GREATER PART OF THE ICE WAS BELOW THE SURFACE

"I should like to show your Highness something. We will inquire."

Word was brought that the cook had some ice, so the Fairy ordered a lump to be brought up in a glass bowl or jug of water. "It must be glass," she said to the servant.

"You want to be able to see through it," said the Princess, "do you not?"

When the bowl was brought, the Princess at once saw that by far the larger part of the ice was below the surface of the water. She was told that this was always the way in which ice sailed.

"Salt water, however," said the Fairy, "is heavier than fresh water, and therefore holds up the ice a little better."

"We will try," said the Princess, and ordered some sea-water to be fetched. When it came, she put the lump of ice into it and found that it stood a little higher than in the fresh water. Still, in both cases, the chief bulk of the ice lay below; and when she saw the pictures of icebergs, and heard that they were often taller than the masts of ships, she had some idea of their immense size.

"For, however high they look," she said, "we know there is much, very much, more that is out of sight."

STEAM, CLOUDS, AND RAIN

"I am going to make a cloud," said the Fairy.

"Was I not right when I called you a fairy? You are a real live fairy!"

"But anybody can do this," said her

friend, laughing. "Listen! This water is just going to boil."

She had a little silver kettle on a spirit-lamp, and was about to have a cup of tea. Out came the steam in a puff of cloud, and the Fairy poured some water into her teapot; but she did not put the lamp out at once, because she wished the Princess to notice one or two things.

"Do you call that a cloud?" said the Princess. "I call it steam."

"You are right, but so am I. You can make rain if you like to hold this cup against the steam."

"The inside of the cup is quite wet," the Princess said, a minute later. She went on holding it, and soon cried out:

"There is water in the cup. The steam is turning into water again."

"And very soft, nice water it is," said the Fairy. "It is said to be 'distilled.' You would be tired of holding the cup so long; but if you chose, you could have all that is now in the kettle brought into the cup in this way."

"I am afraid I should be tired."

"Will you look next at the spout of the kettle? Does the cloud begin close to the spout?"

"Why, no! I always thought it did. There is nothing close to the spout."

"Nothing that we can see, Princess. We hear the water boiling and bubbling in the kettle, and outside we see a cloud of steam, and you have just seen that steam can be turned into water again. The steam finds its way out of the kettle-spout, and it comes out first as an invisible fairy. Perhaps it wants to remain invisible; but in a moment another fairy touches it with a wand and it is obliged to show itself in its white dress."

"I like this story," said the Princess. "Who is the fairy with the wand?"

"Cold air."

"But would you call the air in this room cold?"

"No, it is not really cold, for it is summer-time; but it is colder than the inside

OUT CAME THE STEAM IN A CLOUD

of the kettle, and colder than the steam itself."

After a time the Fairy put out the lamp, and, taking off the lid of the kettle, she showed the Princess that only a very little water was left.

"Nearly a kettleful of water has gone into the air. I have not used much for my tea, but the air has had a good drink."

"It does not feel at all wet."

"There is too much of it for one kettleful to make difference enough for us to feel."

"Shall we go into the garden now?"

As soon as they were out of doors the Princess looked about her.

"It would take a great many boiling kettles to make all this air damp," she said.

"Nature wants no kettle," answered the Fairy. "She manages to work with the sun, sea, lake, and river. She has a bigger fire than any we could light, and with this she turns water into steam; I mean the sun. The sun looks small because it is so far away, but it is really an immense globe of fire. It would take a million worlds like ours to make one sun.

"The sun draws up water from the sea, and from every river, lake, and pond. The vapor which is thus drawn up by the sun is mostly invisible. There is always vapor in the air; there is some to-day, though not so much as there often is. This is the sort of day that washerwomen call a 'good drying day.'"

"What do they mean, Fairy?"

"Did you never have a doll's washing, Princess? Ah, then, you have missed one of the joys of life! Let us have one, you and I together, while this fine weather lasts, say to-morrow, for it is too late to-day."

The Fairy continued: "I went this morning to see the poor woman whose child is ill, and found her hanging clothes out in her little garden. She told

A BEAUTIFUL DRYING DAY

me it was a 'beautiful drying day,' and I could see that the light breeze, the warmth, and dryness of the air, were carrying away the water from the clothes as fast as possible. You remember soaking the flannel and calico in water, do you not? Hung up in the air, they would have become dry again—quickly if the air had been dry and thirsty, slowly if it had already in it almost as much moisture as it wanted."

"When has it plenty of moisture in it?" asked the Princess. "When the rain falls, I suppose."

"Yes. But there are also many days that we call damp days when no rain falls. Those are the days when vapor

is going up from sea, lake, river, pond, and earth."

"From the earth, Fairy?"

"Yes, because, when the rain falls it falls as much on land as on water. It sinks into the earth and makes it moist. The plant roots drink some of it, and it helps them to grow, and they give off what they do not want in the form of vapor. The vapor comes out of the pores in their leaves. Then, part of the rain that falls on the earth sinks deeper down, wanders about among the rocks, and bursts out later somewhere as a spring. And so, in one form or another, there is always plenty of water in the earth."

The Princess still continued her talk with the Fairy. "And can we never see the water going up from the earth and sea and from my little pond?"

"Oh, yes, Princess, often! It is not so very long ago since we were grumbling at the foggy days, just before the daffodils appeared, you know. And we have had morning mists and evening mists often since then."

"Fog and mist! Is that the way in which water is drawn up by the sun?"

"Some rises as vapor that cannot be seen; some is seen, and we call it mist or fog."

"I wish it would always be invisible, then. How is it that we can see it sometimes?"

"How was it that we saw the steam-cloud a little way from the kettle's spout?"

"I know how it happened. It was because the air was cooler outside, and changed the vapor into tiny steam-drops."

"It is exactly the same out of doors," said the Fairy. "If the air happens to be colder than the vapor, the vapor is chilled and has to change its form. It was warm before, and so could rise easily, for warmth causes things to be light; but now it hangs heavily in the air, and we say, How clammy and unpleasant it is!"

The Fairy now pointed to some beautiful white clouds that were sailing

"THEIR NAME IS CIRRUS"

high up in the sky, feathery and curly in shape, and very light and delicate. "I can see plenty of vapor up there," she said.

THIS KIND WAS CALLED CUMULUS

"Clouds?" cried the Princess. "This is astonishing! Were they once mist, and fog, and vapor, and water?"

"Yes, and they will be water again, most likely. But this is a special kind of cloud. It is very high up; it may be now as much as ten miles above us. None of our winds can touch it; but there are winds up there which are blowing it along very swiftly."

"How do you know that it is not being driven by our wind?"

"Very easily, dear Princess. Which way is this little breeze coming? Turn your face to it so! Now, are the clouds being driven in the same direction?"

"Oh, no! They are going exactly the opposite way. They are very pretty, Fairy."

"They are called curl-clouds, because they look like curly feathers or curly hair. Their grand name is *cirrus.*"

"I like curl much better."

"But *cirrus* means curl; and if you had been a little Roman girl you would have talked of one of these dark curls of yours as a cirrus."

"How very droll!" laughed the Princess.

Next day the Princess had an opportunity of studying another kind of cloud. It was much lower down in the air than the curl-clouds; and it was much larger, and seemed to be heaped up in great round masses which rested on a floor of cloud.

This kind, the Fairy told her, was called *cumulus;* but she could say heap if she liked, for the word *cumulus* was only the Latin for a heap.

She watched the clouds for a very long time, and the Fairy watched with her. They sat on a garden-seat, and saw the great masses slowly moving across the sky, changing their forms continually, building and unbuilding themselves, and shining all the time most beautifully in the light of the sun.

The Princess found that she could see pictures in the clouds as well as in the fire. "Better, I think," she added, "for I need not burn my cheeks."

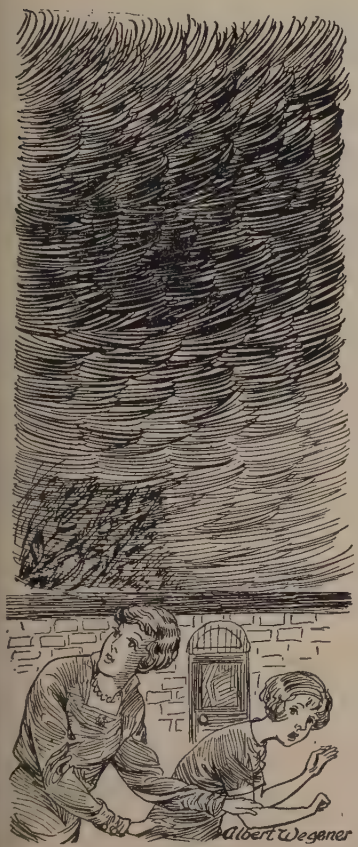
She saw faces, dogs, men, giants, trees, castles, and many other wonderful things, as the heap-clouds passed before her.

A few days after this she saw a mist rising from the sea. It looked very dull, she thought, and not pretty. The

sky-line, or horizon, was almost blotted out, and the ships and little boats looked dim. There was no wind, and the Princess said, "How steamy it is!"

Another day, toward sunset, there was a fine sight to be seen. The clouds were all laid out in long, straight lines. They looked quiet and very peaceful, and bars of gold and red sky appeared behind them.

This kind of cloud proved to be *stratus* cloud. *Stratus* is Latin for bed. The Princess was very fond of talking about curl-clouds, heap-clouds, and bed-clouds; but the Fairy found that she knew the learned names quite well, and could even spell them.



NIMBUS, OR STORM, CLOUDS

They had to wait a long time before a *nimbus,* or rain-cloud, appeared. Then, one morning the highest hills were seen to be hidden by thick clouds; and the Princess laughed to see a great cloud rolling slowly down the side of the very mountain she had often climbed on her donkey.

"How would it feel to be up there just now?" she asked. "What is it like to be in a cloud?"

THE CLOUDS WERE IN LONG STRAIGHT LINES

"It is just like being in a thick mist down here," the Fairy replied. "In fact, a cloud is a fog or mist, only high up in the air, and a fog or mist is a cloud, only down close to the land. Now the last bit of blue has gone, and I do not think we shall see sky or sun all day."

THE WORK OF RIVERS

"How did this little stream begin?" the Princess asked. They were sitting at the edge of a pebbly brook on the hillside. The Fairy was knitting, and the Princess, who was dabbling with her

THE PRINCESS WAS DABBLING IN THE WATER

fingers in the water, had kept silence for a long time.

"The rain must have been at the beginning of it," said the Fairy. "The drops of rain sink into the ground and work their way about among the rocks. They break out into the light of day when they come to some rock or soft earth through which it was easy to pass. Or we can imagine another way. Suppose we have a flat piece of land before us. The rain falls upon it, and finds out the slightest rise, the slightest slope."

"But I thought it was flat?" said the Princess.

"Not flat like a polished table, but as flat as any stretch of mud, sand, or earth is; and that, your Highness knows, looks flat as a whole, but is really covered with tiny ups and downs. In our new land these ups and downs are too small to be thought of, but the rain finds them out at once. Water always wants to go downward; it tries to get to the lowest level. And so the water-drops do not stay where they are when they have fallen. They begin at once to run, and it is quite easy, then, to see which way the ground slopes."

"We saw crowds of tiny streams yesterday on the sands when the tide was going out."

"So we did. And it will be worth while to go again to-morrow and watch them at their work. It would be impossible to make the weakest of them run uphill, even if the hill was only the smallest bit of an inch. But let us go back to our piece of land. The pattering raindrops would soon make little dimples on it if it were moist, and thus there would be more roughness and tiny ups and downs. Also, every time the rain fell and the water ran off along the easiest way it would wash out fine particles of mud, and so the channel would be deepened. Thus, every shower that fell would find a deeper channel, and this would gradually grow deeper and wider. At the same time other little channels would be made, and as they went on they would meet and run together. How many rills are there, I wonder, coming down that hillside?"

"Eleven," said the Princess, after steadily gazing at the opposite hill.

"All of them, most likely, join a good deal lower down and make three or

four streams, and they all go, I know, into the river which is at the bottom of the valley, and the river carries them on into the sea."

"Did every stream, then, cut out its own channel?" asked the Princess.

"I think so."

"But not every river? not a wide, large river like that one over there?"

"Why not? It only needs time. Every hour that water is flowing its bed is being worn a little deeper, a little wider, so little that it is not noticed. And every time the rain falls the sides of the stream are washed and worn a little more, until at last we see them as sloping banks. The whole of that valley where the river is, was, most likely, scooped out by the river itself."

"You say the most astonishing things, Fairy!"

"Your Highness would be astonished to see what the Colorado River has managed to do! The river flows, during part of its course, at the bottom of a deep chasm, and steep straight walls of rock stand up on either side."

"Like the rocks where you found the glacier-scratches?"

"Much higher than those. In some places the walls are more than a mile high."

"Oh, Fairy!"

"It is perfectly true. If we were at the top we should look down on the narrow, foaming river more than a mile below us."

"What a sight that must be! When I am grown up I shall travel."

"Well, all that deep, deep channel has been cut by the river Colorado. It began on the top, on the surface, ages ago, and has been slowly working its way downward ever since."

"But how is it," asked the Princess, "that the banks stand up straight and high? You said a few minutes ago that the rain washed the sides of a stream into sloping banks."

SOME MEN WERE AT WORK

"Hardly any rain falls in that part of the country. That makes all the difference, Princess. In our valleys here there has been so much rain that there is a wide and almost flat space between hill and hill.

"It may sound wonderful that water is able to alter the shape of the land like this. Yet it is still more wonderful to remember that but for water there

would be neither valleys nor hills at all. Water and ice, and ice is only another form of water, have cut them all out."

"It does seem very wonderful," the Princess said.

The Fairy explained that water alone can easily cut through earth, sand, and such soft rocks as chalk and sandstone. But it cannot do much toward wearing away very hard rocks unless it has the help of such things as pebbles and sand. It nearly always, however, has such help, and so every hard point in the river-bed is ground and scoured.

The two companions now entered the grounds of the Queen's house by a little gate that opened at the foot of the hill. They had followed the brook all the way, and saw it fall into a large pond just inside the gate and among the trees.

The Princess had often seen both brook and pond before, but now she stopped to look. Some men were at work on the other side. They took off their caps when the Princess came up. She wanted to know what they were doing.

"We are cleaning out the pond, your Highness," said one.

"What is the matter with it?"

"It is choked up with sand and mud, please your Highness."

"All this rubbish in the pond must once have been part of the hillside."

The Fairy nodded and smiled.

"How often is the pond cleaned out?" she asked of the men.

"It is about three years, my lady, since it was cleaned," was the answer.

The Princess and the Fairy went on, and the Princess said: "I see plainly that if the pond were not cleaned it would become dry land very soon, because of all the sand and earth brought down by the stream."

"It would most likely be bog-land, Princess," the Fairy replied, "for the water as well as the sand and earth would still be coming, and the whole of this hollow would be a marsh. There is a fine lake (and a lake, you know, is only a large pond) through which a river flows. The river comes into it in a very muddy state, laden with spoils which it has carried off from the Alps. It drops all these spoils into the lake, and goes out at the other end beautifully clear and clean. The result of this is that new land is being made at the upper end of the lake, the end where the river comes in. Your beloved Romans, Princess, had a little town at the edge of the lake. If they could come back now they would be very much puzzled, for it stands to-day two miles from the water."

"It seems to me," said the Princess, as she settled herself on a garden-seat, "that rivers are constantly carrying land about from place to place. They take it up, break it into little bits, and then lay it down somewhere else. What is the use of all this?"

"Nothing would grow in rock, but if the rock be ground to powder it makes fresh soil, and our plants can grow in it," said the Fairy.

"There is another way in which new soil is brought by a river. It does not always wait till it reaches pond, lake, or

sea. Heavy rain or the quick thaw of snow may so fill it that it overflows and floods the land on both sides. I have seen boats sailing over fields where, in the summer-time, I had picked flowers or made hay."

"What a mess it must make of the pretty fields!" said the Princess.

"At the flood-time, yes. But it does a great deal of good. A fine layer of mud is evenly spread over the land, mud brought from a great distance, remember, and therefore not like the earth of that part of the country. It makes new rich soil for the next crop of hay or for the grass which the cows feed on. Low-lying meadows by a river-side are generally flooded every year. The strangest river for this kind of thing is the old Nile. I suppose there would be no Egypt without the Nile. The land is sandy and bare, the heat is great, there are few trees, and rain hardly ever falls. The river begins to rise about the end of June or beginning of July, and goes on slowly rising till the end of September. Then it begins to go slowly down again, but it has left by this time a layer of mud over all the fields on both its banks."

TALKS ABOUT METALS

SILVER

THE little Princess did not grow strong for a very long time. There were days and nights when her head ached and she felt weary, and the Fairy had often to be patient with her. But she never lost heart, and always hoped for the good time that was to come.

The Fairy was very careful that she should be "early to bed and early to rise." The little Princess went to bed with the birds, and rose soon after they began to sing. Breakfast was ready for her as soon as she was dressed, and then she went out of doors at once.

Her kind friend promised that when the warm weather should come, all her meals should be served in the open air, and she looked forward to this as to a great treat.

She was taken out for drives at first, but the Fairy soon found that they reminded her too much of the grand drives in town, and therefore did not amuse her. So she bought for her a stout donkey, and on this the little lady rode every day, round and round the gardens, and, after a while, outside in the green lanes and along the seashore.

They played at ball also and at other games, and shot with arrows at a target; and they had many quiet times when the Fairy sang or read aloud or told beautiful stories.

But sometimes the little girl shed tears and said piteously that she was "hungry for books," and then the Fairy would comfort and kiss her, and remind her that the books were not gone forever.

One day, when her sorrow had been more serious than usual, the Fairy said, "There is no reason why you should not

SILVER AND GOLD

have a lesson every day, as you are so fond of lessons."

"How can I have a lesson without a book?" inquired the Princess, letting her handkerchief drop from her eyes.

"Your Highness seems to forget that we are in Fairyland!" her companion replied, with a smile.

"Ah, yes!" said the Princess, sitting up and looking interested. "Well, how do you do it?" and she slipped her handkerchief into her pocket, for it was wanted no longer.

"We may have a lesson every day, if you like, Princess——"

"Of course I should like it!"

The Princess used to drink out of a silver mug. She was fond of this mug, for she had had it all her life, and her name was engraved upon it.

She began one day to wonder where silver came from, and what it was, and whether men made it or found it. So the Fairy told her all about it.

"Silver is found in the earth," she said, "deep down underground, in mines. Some of it is mixed with other things, but a good deal is found quite pure. No metal is so white as silver. Tin is something like it, but it does not shine so beautifully. Then, again, silver is hard. It is not so hard as copper, but harder than gold.

"And silver can be hammered into leaves which are wonderfully thin! It can be hammered until it is as thin as the ten-thousandth part of an inch."

"It makes my head ache to think of it!" said the Princess. "And yet the particles hold together! Stone would fly all to little bits."

"Then silver can be pulled out lengthwise into a very long wire. A pound of silver can be drawn out until it is more than four hundred miles long."

"You must mean yards, Fairy."

"No, miles. Then I must tell you that silver can be melted.

"And there is another thing to be remembered about it. It never rusts. Iron and steel rust, you know."

"Yes, I have had ever so many of my things rusted since we have been here. One day I left my knife out of doors, and another day my scissors, and you saw what a bad state my hoop was in after lying out in the rain all night. So silver never rusts?"

"Though it does not rust, it tarnishes, if there be any sulphur-gas in the air."

"And what do you mean when you say that silver tarnishes?" asked the Princess.

"Have you never seen silver look dull and nearly black? It is easily rubbed bright again, but it looks ugly while the cloud is over it."

The Princess considered for a minute, then she said: "This morning my egg-spoon turned very dark-looking. Why should gas be in the air when I eat an egg?"

"It is in the egg itself, Princess, in the yellow of the egg. Sulphur and silver seem to like each other. They join every time they meet."

GOLD

"Now let us have a talk about gold, Fairy! Please take off your gold brooch, and let me look at it, and your bracelet, too! I like gold-color. It makes me think of sunbeams, and buttercups, and dandelions. Surely it did not come out of the dark earth?"

"It did, indeed!" said the Fairy. "It is often found in a beautiful white rock called quartz, and often, again, by itself, and only sometimes mixed with other metals. In some countries a little of it is found in the rivers, and people carefully wash the sand or earth of the river-bed to find it."

"And can it be hammered and pulled out like silver?" asked the Princess.

"It can be made much thinner than silver. No other metal can be made so thin. A single inch of gold can be divided into two hundred and eighty-two thousand leaves. Gold can be drawn out into wire rather longer than silver wire, but not a great deal longer. Gold wire can hold a very heavy weight without breaking; but not so heavy a weight as silver wire can hold. Silver is stronger than gold in this way."

"Can gold be melted?"

"Yes, and there is one curious thing about it when it is in the hot liquid state: it does not send off any steam, and so does not lose weight."

"I don't understand!" said the Princess, knitting her brows.

So the Fairy had to explain that water and other liquids, when boiling, give off steam. "Indeed, they themselves turn into steam," she said, "and go out into the air, and at last there is nothing whatever left in kettle or pan. But it is not so with gold, and when it becomes a solid again men weigh it and find that it has lost nothing. We often call it a 'perfect metal' because of this. Then it neither rusts nor tarnishes."

As the Princess seemed interested, the Fairy wrote to a learned man in the great city and asked him to send her some specimens of metals, and this he was very glad to do.

When the little box arrived the Princess insisted on unpacking it herself. She found inside several very small boxes, each one bearing a label with a name upon it.

In one box was a tiny gold-nugget, in another some gold-dust, in the third a

bit of quartz with a gold vein running through it. The fourth contained a little lump of pure silver, the fifth some silver mixed with copper, and the next three held three different kinds of silver ore.

The Fairy's friend had also put in pictures of gold and silver mines, and of the washing of river sands and mud. There were, besides, some maps which showed the countries in which gold and silver are found.

MERCURY

In one corner of the box was a bottle labeled "Mercury," and the Fairy took the cork out and emptied its contents upon the table.

There was an outcry of surprise and delight from the Princess, as she saw tiny silver balls running about. She found that she could break them up with her finger into smaller and yet smaller balls, or make them run together and become one good-sized globe.

Much time was spent in this amusement. Then the little girl wanted to know what the pretty stuff was, and why it was called mercury when it shone like silver. She was pleased to hear that it had another name—quicksilver; and she thought that this exactly suited it until the Fairy reminded her that Mercury was the name of the Greek and Roman god who was very quick and clever.

"Oh, yes!" said the Princess, "and his staff had wings on the top of it, I remember! Both names suit this shining, rolling metal, after all, I see. But is it a metal?"

"It is truly a metal and, when frozen, it is solid and looks more like what you would expect a metal to be. In very cold countries it is always solid."

"I suppose it is the only metal that runs about?"

PLAYING WITH MERCURY

"Yes, the only one. When it is frozen it can be hammered, but not now!"

"Imagine trying to make a wire of it, or hanging it up to support a weight!" laughed the Princess. "It is a pretty little lively good-for-nothing!"

"Not quite, Princess. Here is something at the bottom of the box; a small square of——"

"Looking-glass!" ex-

claimed the Princess, starting at her own portrait thus suddenly placed before her. "But what has this to do with quicksilver?"

"Just look at the back of the glass and you will find out for yourself. What is this silvery substance? Scrape a little off with this pin—no, not with your finger-nail!"

"Well," said the Princess, drawing a deep breath, "it is only glass after all, with mercury at its back, and now the mercury is off I cannot see myself at all!"

"Here is something else," the Fairy went on, opening the Princess' paint-box, and taking out a bright red cake.

"Vermilion," said the Princess. "I once painted my big doll's lips and cheeks with it."

"It is made from mercury. Hundreds and hundreds of years ago the Greeks used to fetch vermilion from mercury mines in Spain, and these mines are being worked still.

"One thing to be always remembered is this: that everything made from quicksilver is poisonous."

"Ah, that is why you never let me put my paint-brush in my mouth. Thank you, Fairy, dear!"

"Mercury," continued the Fairy, "is useful also in helping to set gold and silver free from their ores."

"How?"

"It is rather difficult for me to explain, or for you to understand, Princess. I believe that silver ore, for instance, is ground to powder in a mill, passed through a sieve, mixed with salt,

"WHAT HAS A LOOKING-GLASS TO DO WITH QUICKSILVER"

and then put into a furnace and brought slowly to a dull red heat. It is kept like this for many hours, and stirred about many times. The heat makes some of the things that are in the ore pass away in vapor. When they are gone, the furnace is made hotter—hot enough to tear the salt in two."

"I was wondering what the salt was there for," said the Princess.

"Salt is made of two things, you know, my Princess, and one of the two is a gas. As soon as this gas is set free, it seizes upon some other things in the ore and flies away with them, leaving the silver purer.

"After all this roasting in the furnace comes another grinding, and then the silver ore is put into a cask with a good

deal of water, and when it is well mixed with the water our friend mercury is poured in. Next, the cask is rolled round and round, for many, many hours until the mercury has dissolved all the silver and every other scrap of metal which may be with it."

"Dissolved, Fairy? What a power mercury must have!"

"A great power! Then a good deal of cleaning goes on until the silver is set free from almost everything but the mercury. And now the question is, how to get rid of the mercury, for we want our silver pure, not mixed with quicksilver."

"It's a puzzling question," said the Princess. "I am glad I have not to answer it."

"What the men do is this: they know that mercury has the power of turning into vapor and flying away. So they make up a good fire under the pot, and he flies away and the silver is left behind."

"That is clever. And is the mercury quite lost?"

"No. Though they drive him away from the silver they do not wish to let him go altogether, so they catch him as he comes out at the end of the pipe."

"What pipe?"

"A pipe leading from the vessel that holds the silver. They catch him and turn him back into the shape he had before the shape in which we see him to-day."

"We know that silver tarnishes, that iron rusts, and that gold neither tarnishes nor rusts," the Fairy began. "Mercury rusts, though only when heated. Air and moisture attack it in vain, but let it be made hot and let the air get at it, and red-colored specks will appear on its surface, and at last nothing is to be seen but red powder.

"And the powder is heavier than the mercury was at first. Suppose that there were one hundred pounds of mercury, there would be one hundred and eight pounds of rust. Something must have been added to the mercury to make it so much heavier. But where did this come from? Nothing but air has touched it the whole time. Then it must have come out of the air. A wise man, more than a hundred years ago, was much puzzled by this, for at that time no one knew that air was made up of two gases.

"They thought that air was one thing. An element, they called it. When anything is made up of one substance only, it is said to be an element. Gold and silver are elements. Oxygen is one of them, nitrogen another, hydrogen another. The people who study these things divide all that they can see into two classes, elements and compounds."

"What do they call me?"

"A compound," said the Fairy, "because your body is made up of several elements.

"Now, to go back to our subject, it was through quicksilver-rust that air was found out to be a mixture. The wise man who heated the quicksilver, and turned it into red powder, weighed it, and found it to be much heavier than it had been. He then went on to try to

put it back into its bright state, and to catch the other substance which had made it heavy."

"How could he possibly do that?"

"Let me see if I can make it clear. He took the red powder and made it so very hot that the something which he could not see went out of it and left the mercury looking like its old self—like these balls on the tray. Before doing this he arranged a trap to catch the something."

"The invisible fairy," said the Princess.

"He put a glass tube in its way when it was going to escape, and it had to run down through it into a bowl of water. The man who was watching saw bubbles rise in the water, but could not see the thing itself.

"He had a glass jar ready to catch the bubbles. Now he had them fast! What was this invisible fairy? The glass jar looked as any other glass jar would look that was full of air; that is, there was nothing to be seen! He dipped into it a lighted taper, and the taper burned far more brightly than it ever would in ordinary air. He blew the taper out, and put in its glowing point, which instantly burst into a flame——"

"Why, it must have been oxygen!"

"You are right, Princess," said the Fairy, "it was oxygen. At last every one came to understand that there must be two gases in the air. They went on with their experiments until they were able to tell exactly how much oxygen and how much nitrogen there always is in pure air."

"And how much is there?"

"There is always a great deal more nitrogen than oxygen. If you can imagine the air cut up into five equal portions, one portion only is oxygen and four are nitrogen."

"I am sorry to hear it! Oxygen is so good for us."

"More would not be good for us; it would be too strong. All this knowledge came out of the mercury-rust! Is

THE PRINCESS LEARNS ABOUT THERMOMETERS

it not strange? And now we see that oxygen likes mercury and lays hold of it."

"It likes hot mercury, you mean, my dear Fairy! It takes no notice of mercury when it is cold."

"That is a capital way of putting it," replied the Fairy. "Now, are you tired, or shall I tell you one thing more?"

"One thing more, please," said the Princess, who by this time was trying to coax the quicksilver into its bottle.

"It is about this thing that is hanging on the wall," said the Fairy. "You

"WHY DOES THE FIRE BLAZE LIKE THIS"

see this little glass tube with a bulb at the lower end. What is it filled with?"

"With quicksilver; at least, it looks like quicksilver. What is this row of figures here? Is it a sum?"

"No," said the Fairy, smiling. "I must tell you, first, that quicksilver becomes larger when it is warm and smaller when it is cold."

"That is curious," said the Princess.

"No, not very. All liquids do so. Water does, for instance. Heat pushes the particles farther apart; cold makes them cling together.

"The man who was making this thing placed it in boiling water and saw the mercury rise high in the tube and stop just here, and he put a mark against the place, wrote '212,' and called it 'boiling-point.' You see, Princess? Then he got some ice, broke it up, and let the tube stand in it. Down went the mercury, down, down, till it came to this place and would go no farther. So he wrote against this 'freezing-point,' and the number '32.'

"He next divided the space between the two points into equal parts and called each one a 'degree.' "

COAL

"Do you remember, Fairy, that we once saw pictures in the clouds? I have often seen them since. Now I am seeing pictures in the fire."

"It seems pleasant to have a fire again, now that the days are closing in and the evenings are longer. Let me look, too. I see a black rock with flames bursting out of its side."

"Why does the fire blaze like this?" asked the Princess.

"It is the gas in the coal that is escaping."

"What gas?"

"There is oxygen in coal, and nitrogen, and hydrogen. There is also your friend, carbon, Princess."

"It must be the carbon that takes fire," said the Princess.

"Yes, and hydrogen, too. Both the carbon and the hydrogen in the coal take fire readily and burn well."

"I wonder the nitrogen does not put the fire out."

"Oh, there is very little nitrogen! It cannot make much difference. All the gas in this coal is now coming out into the air here or going up the chimney, and soon we shall have only cinders in the grate. Here is a cinder that has dropped out and becomes cold. It does not look much like coal now, does it? All the gas has gone out of it."

"Then the gas has taken away all its black shininess!"

"This is the way men get gas for lighting streets, shops, and houses. They do not exactly burn the coal, but they make it very hot in a large closed vessel which is placed in a fire. They do not let the gas run away as we are letting it just now. They have a pipe ready to catch it and carry it into another vessel where it is cooled.

"It passes on again through more pipes and vessels until it is quite purified, and then it is stored up in very large places, ready to be sent into pipes along the streets and into houses."

"And what about the coal that has the gas taken out of it? Is it all in cinders like this?"

"Something like this. It is called coke, and it is still good to burn, just as cinders are. It is very light in weight."

"So is the cinder."

"And you could not make it burn easily without coal, for it has lost its gas; but it is very good for putting on the fire and sending out a strong red heat. And so nothing is lost."

"How did the gas get into the coal first of all?" the Princess asked, "and where did the coal come from?"

"Two questions in one, and one answer will do for both," said the Fairy. "But I must first ask you a question, Princess. Have you any idea what coal is, or was?"

"All I know is that it is dug out of the earth. I suppose it must be a mineral."

"A mineral it is now, but away in the far ages it used to be alive; it used to grow. This lump," taking up one with the tongs, "was probably part of a tree, and the tree was part of a great forest. The trees that lived then were most of them more like our ferns and mosses than anything else that we have now."

THE ATTENDANT PRESENTED TWO LETTERS FROM THE QUEEN

"Trees like moss! They must have been very tiny trees!"

"You must fancy them the other way about, Princess: moss like trees! Imagine that creeping moss that there is so much of in the greenhouses growing high up and standing erect; imagine ferns with hard trunks.

"No remains of birds or beasts have been found, but there may have been some for all we know. There were insects, though. Crickets and grasshoppers chirped, beetles and cockroaches crawled about, white ants built their nests. There were also many small lizards, and some larger ones which could live in water and on land. Their footprints may still be seen on the remains of an old sea-beach.

"There was no one then to interfere with anything, no one to cut down trees or pull weeds up, and so everything grew mightily. Leaves, seeds, twigs dropped and lay in heaps about the tree-trunks——"

At this moment the curtain over the doorway was drawn aside, and an attendant stepped softly in to announce a messenger from the palace.

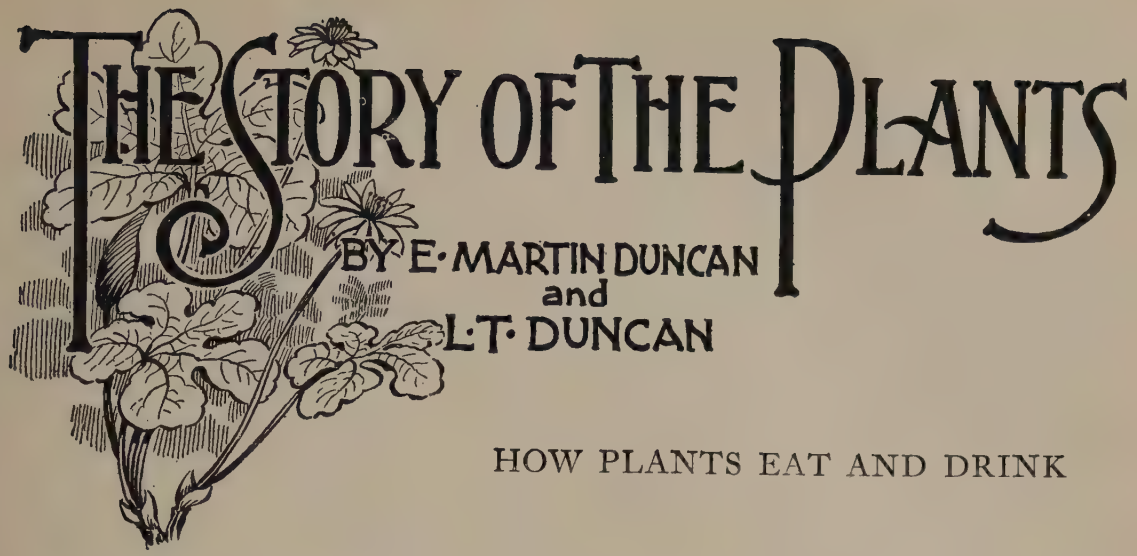
When he entered he bowed low, and presented two letters. They were both from the Queen. One was for the Princess, the other for the Fairy. Then he bowed again, and retired.

As the Princess read hers, her face grew longer and longer, and two tears —but only two—came into her eyes.

"It will be nice to see mamma again," she said, "but I do not want to leave the country."

The Queen had said, "I cannot live any longer without my own girl," and had proposed that she should come home next day for a month, as she was so much better, and try whether she could live and be well in the palace again, with the Fairy to help her.

"It is all right, my Princess," said her friend; "the country is lovely and wonderful, but we shall find lovely and wonderful things in the great city among the men and women. There are many, many things to be studied there as well as here; and the same sky will be over our heads, the same sun will shine for us. Best of all, Fairyland, the real Fairyland, will be with us, in us—always!"



HOW PLANTS EAT AND DRINK

You never see a plant having a meal, however closely you watch it, and yet as long as the sun is shining the plants are busily eating all the time. Perhaps you think that plants eat the mold in the garden beds, feeding on the soil with these rootlets that we cannot see beneath the surface of the ground. But this is quite a mistake. The roots fix the plant firmly in the ground. True, they suck up certain salts from the soil which strengthen the plant like a tonic, but the roots do not feed on the soil. No, the plant is eating with its leaves, each leaf is really a mouth, and all day long the cherry tree, the pansy, the wall-flower, the forget-me-not, and the impudent dandelion, to say nothing of all the other plants in the garden, are sucking in food with their leaves just as fast as ever they can. Of course, we cannot see this, because the plants are eating invisible food, which they suck in from the air while the sun is shining—but it is *real* food for all that.

Now I daresay you know that floating about in the air there are always small quantities of carbonic acid — a gas formed of carbon and oxygen; and it is this carbonic acid gas that the plants are always so eagerly swallowing.

Plants cannot live without air, though some plants can live quite well without soil, and you can easily prove this for yourself by a simple little experiment. If you put a piece of damp flannel in a box and scatter on it some seeds of mustard and cress, then place the box where the seeds will get plenty of air and sunshine, you will (if you remember to keep the flannel moist) have ere long a fine crop of mustard and cress. Each little seed will grow into a healthy, sturdy little plant, although it has had no soil to grow in. Now if you cover the box closely with a lid so that no air can get to the little plants,

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and leave it so for a day or two, when you open the box again all your mustard and cress will be withered and dead. The poor little plants could get no food and have all been starved to death.

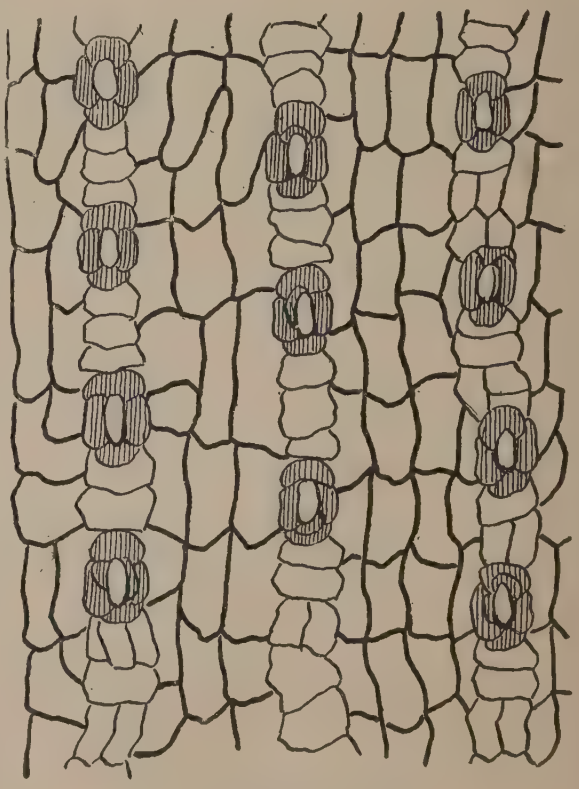
So now you see how very important leaves are to a plant. A plant cannot live without its leaves. When a host of greedy insects strip all the foliage from a plant it will probably die unless it can quickly grow new ones. There are many rootless plants, and others which have no stems, but there are very few plants which are altogether without leaves; and when this is the case the stems have become changed to take the place of leaves and act as mouths to the plants.

Plants often have hundreds of leaves, some of the great trees have thousands, and you may well wonder why they need so many mouths when all animals (including ourselves) can manage very well with only one. But you must remember that the carbonic acid, on which the plants feed, is diffused in the air in very small quantities and the plants cannot move about in search of it. They are obliged to depend for their supplies on the air immediately around them. One leaf could not take in nearly enough of this light and airy food to feed the whole plant. The trees and the shrubs and all the plants in the garden, the meadow, and the woodland, spread out their many green leaves in such a way that they may catch every particle of carbonic acid that is floating around them in the sunlit air.

I daresay you are rather puzzled about this. It is all very well to say that plants eat carbonic acid gas, but, as the young man said to Old Father William: "Pray, how do they manage to do it?"

If we pick a leaf from the cherry tree and examine it ever so carefully, we can find no opening through which it can suck in its food from the air. The leaf is broad and flat, smooth and green, and has two parts—a leaf stalk and a blade. But this is really all we can see. It does not look in the least like a mouth.

Well, to answer the question we must consult the magic microscope, which has the power of making visible



STOMATA

to us all sorts of things that we cannot see with our eyes alone.

If we cut a very thin slice across the blade of a leaf and place it under the microscope it will become greatly magnified, and we see that the leaf is not a solid body. It has an upper and a lower skin, or "tissue" as it is called, and between these two tissues are a number of little cells of different shapes and sizes containing the living green-stuff which gives the green color to the leaf.

Now if we look at a fragment of the leafskin taken from the lower surface of the leaf, we shall see that scattered all over it are dozens of little openings, each one guarded by a tiny pair of lips. These little openings are the breathing pores or mouths of the leaf. They are called "stomata," which is a Greek word for mouths.

The tiny lips are called "guard cells" because they guard the openings in the leafskin, and they can open and shut just as our own lips can.

It is through these tiny lips that the carbonic acid gas is sucked into the leaf from the air around it; and all day long, while the sun is shining, they are taking in food for the plant just as fast as ever they can.

THE LEAVES OF PLANTS

One of the first things to strike us about leaves is their wonderful difference in size and shape. Some are very large, some are very small; some are broad, some are narrow; some have smooth edges, others are jagged or scalloped; others again are cut up almost into fringes or divided into several little leaflets. Round, oval, heart-shaped, star-shaped, like ribbons or swords, cut up into all sorts of curious patterns—there really seems no end to the different kinds of leaves spread abroad by the trees, shrubs, and flowering plants to catch the food that it floating in the air.

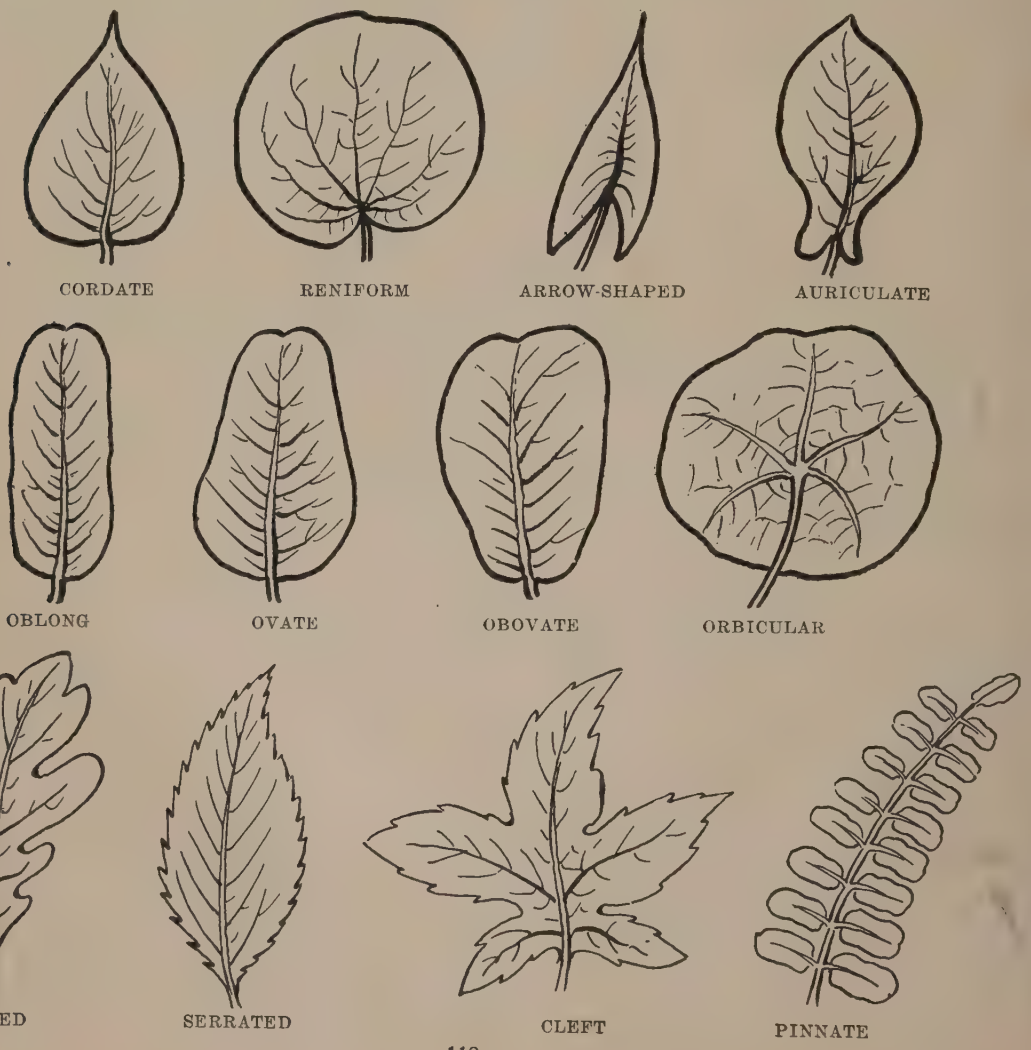
Now why are leaves shaped in so many different ways? Why are some as round as saucers, like water-lily and nasturtium leaves, others long and thin like the grasses?

Well, we know what leaves are for. They act as mouths to the plants, and it is their duty to take in as much food

SPATULATE ELLIPTICAL LANCEOLATE LINEAR OVAL

as they possibly can, so that the plants may grow and thrive. The shape of the leaves depends principally upon the habits of a plant; for plants are always struggling for air and sunshine, and we shall find that their leaves are always formed in such a way that they may get as much as possible of these two good things. Big, strong plants which have plenty of room to grow, like the sunflower and tobacco plant, have, as a rule, very large broad leaves, which they spread proudly in the sun in an almost horizontal position. Grasses that are closely packed together are long and narrow, and stand erect like a regiment of soldiers, so that each blade may get its fair share of the sunlight without overshadowing its neighbors.

In overgrown hedgerows and thickets, where the plants are all crowded together and obliged to struggle and fight with each other for



every atom of food, we shall find that a great many have leaves all split up into points and fingers, or divided into several little leaflets, so that they may more easily catch and hold the broken rays of sunshine that fall through the dense foliage above and around them. These plants have solved the problem of catching the sunlight by dividing each leaf into a number of leaflets.

If you look carefully you will find that most of the plants growing in shady or crowded places either have ribbon-like leaves, or leaves which are much divided and split up in one way or another, while plants that boldly push their way up and overtop their neighbors usually have big, broad leaves. Leaves, too, are almost always arranged on their stems and branches, and held in such a way that they overshadow and interfere with their fellows as little as possible. Look at the ivy covering an old wall and you will see how very slightly the leaves overlap; they are arranged most carefully, so that almost every one can be freely reached by the warm rays of the sun.

THE ROOTS OF PLANTS

Drinking is quite as important to plants as eating. They need water just as much as animals do, and will die if they cannot get it. You know of course that plants drink rain—but how do you think they drink it?

Perhaps you think plants drink with their leaves; sucking in the raindrops as they fall with their hundred of tiny lips in the same ways as they suck in carbonic acid from the air. But no, plants do not drink with their leaves. They have, strange to say, quite different mouths for eating and drinking. They drink with their roots. Their drinking mouths are the tips of the roots, and the little root-hairs that are found growing on the roots of most plants, and with these they suck up the moisture from the soil.

You know if no rain falls for a long time how sad our poor gardens look. The flowers droop their heads, all the leaves hang limp and listless, the grasses turn brown. The plants are sick for want of water. The hot sun hurts them now instead of doing them good. They cannot eat, they cannot work. Then when the rain comes again how the plants rejoice! They hold their heads up once more and spread out their leaves, which rustle with delight as the raindrops patter down upon them and run off in little streams and rivulets to the ground, soaking through the soil to the thirsty roots which drink it up as fast as they can and send the refreshing sap up through all the stems and branches. Now when the sun comes out once more the plants are able to feed and work again, and all is well in the garden.

If when the plants are crying out for rain we take pity on them and water them, we must remember that they must have a thorough soaking so that the

water may sink right down to the roots. To sprinkle the ground a little only makes matters worse for the poor plants, for the rootlets push their way up to the surface to reach the water, the sun soon dries up the ground again, and the rootlets are burned and shriveled up. Neither is it any good simply to water the leaves of a plant, for although the leaves may absorb a small quantity of moisture they cannot take in nearly enough. Unless the roots are able to drink, the plant will die.

But roots have other duties besides supplying the plants with water. They fix the plant firmly in the soil, and this they do thoroughly and cleverly that we might well imagine that roots have minds to think about and understand what they have to do. Indeed a very great and clever man named Charles Darwin, who taught us a great deal that we know about plant and animal life, once compared the roots of plants to the brains of animals, because of the wonderful way in which they behave. The roots go steadily pushing their way along beneath the ground, sending out numbers of rootlets like so many little fingers, which wriggle and squeeze their way through the pebbles and rubbish in the soil, touching and feeling everything as they go. Here a rootlet firmly wedges itself into some crack or cranny, here another coils itself tightly round a stone—each rootlet doing its best to anchor the plant securely in the ground. If a rootlet touches something underground that it cannot grasp or push its way under, it will even turn back and start feeling its way in another direction.

Now the tips of the rootlets are much too tender to force their way unaided through the ground, so each rootlet wears a little shield called a root-cap, which protects the tender growing point so that it is not bruised as it pushes its way between the grains of sand, pebbles, and other hard things it encounters in the soil. The root-cap is shaped like a tiny thimble and is made of several layers of hardened scales. As you would suppose, it gets very much worn by all the hard work it has to do, and the constant rubbing of the pebbles, and flints, and one thing and another, as the root keeps growing and pushing it along through the ground. But as fast as the outer layers of the little root-cap are worn away they are replaced by fresh layers from within, manufactured by the industrious little growing point itself.

Water plants and plants that live in marshy ground do not, as a rule, have these little root-caps on the tips of their rootlets; for as they have only to make their way through water, and soft mud, the tender growing points do not of course need protection in the same way as the growing points of land plants do.

The roots of all plants are not exactly alike. Some plants have tufts of rootlets like bunches of tangled threads, or like whipcord. Annual plants which spring up, flower, bear seed, and die all in a single year usually have roots like this, for very strong roots are not necessary to them. Plants which have a

longer life have, as a rule, a strong main root, called a "tap-root," which bores straight down into the ground, and from this many rootlets branch out in all directions. Some plants have no side roots, or only a few very small ones, but the main root grows very long or very stout. Carrots, turnips, beets, and radishes have roots like this; and they are, as you know, very good to eat.

Forest trees have enormous roots stretching in all directions, ever so far underground, for they are needed to support the great trunks with their many leaf-covered branches, and to keep them safely anchored when fierce gales are blowing. The strong wind is one of the foes trees have to contend against, and their great roots, fixed so well and deeply in the earth, enable them to withstand its violent attacks. But, sad to say, the wind now and then wins the day in spite of the great strength and the mighty roots of the giant trees of the forest; and after a great storm we may sometimes see a splendid oak, or elm, or some other fine tree lying helpless on the ground, like a warrior slain in battle, with its great roots torn from their hold in the soil—laid low by its enemy, the wind.

Besides anchoring the plants in the earth and drinking water, roots also extract from the soil several things which are necessary to plants, and which act as a tonic, making them grow strong and healthy. In the soil are several kinds of salts which help to nourish and strengthen the plants; and these salts the roots suck up dissolved in the water they drink.

So now we see why farmers and gardeners think so much about the soil in which their crops and plants grow, and why plants flourish and grow strong in good soil and are weak and stunted in poor soil; for we might very well suppose (if we did not know better) that as plants get their chief supply of food from the air it did not matter a bit what sort of soil they were rooted in. All plants do not require exactly the same kind of tonic; some need one thing, some another; and that is why different kinds of plants thrive best in different kinds of soil.

Although, as a rule, the roots of land plants strike downward into the ground, there are some plants which have numbers of rootlets growing from the stem above the ground as well. These are called "aërial roots" because they grow in the air. If you look at the ivy you will see how fast it is clinging to the wall with its tiny finger-like rootlets.

You would hardly think as you played in the garden or walked down a country lane on a bright, sunny day that all the plants around you were just as busy as busy could be, making starch and sugar and other good things. But they are. Plants work hard for their living. Some to be sure are more industrious than others (as is the way all over the world), but there are very few idlers in plant land. For if a plant stops making sugar and starch and working these materials up into a wonderful living jelly, that plant must die. This sounds rather like a fairy story. But it is quite true.

First of all, what is this wonderful jelly that the plants are making, and of what use is it to them?

Well, it has a very long name, but that we need not trouble ourselves about; it is enough to tell you that it is the very foundation of all life. You and I, every animal, every plant, in fact, every living thing under the sun, is all built up entirely of this wonderful living jelly that the plants are making. We cannot make it. We can extract sugar and starch from plants, but we cannot turn these things into living jelly, although many people have tried hard to do so. Plants are the only things in the world that can manufacture this living substance for themselves.

Each plant is a living factory. The workers in the factory are the tiny green bodies which are packed close together in the long green cells in the leaves. The materials used to make the sugar, starch, and living jelly are the carbonic acid gas sucked in by countless tiny mouths in the undersurface of the leaves, the water sucked up by the roots, and the dissolved salts of the soil. And the power that sets the leaves all working is the sun.

At the top of a leaf are a row or two of tiny cells, closely packed together. They are colorless, and filled with water sent up from the roots, making a sort of water cushion on the top of the leaf.

Below this cushion of water cells comes a row of long-shaped, green cells. They are called "palisade" cells because they look very much like a garden fence made of a lot of upright pailings.

Below the palisade cells is a thick layer of spongy cells with large air spaces between them, and underneath this is another row of water cells. Between these cells are the stomata or tiny mouths of the undersurface of the leaf, each one opening directly into one of the large air spaces.

Now what happens when the leaf is at work is this. As the sun shines warmly through the transparent water cells on the top of the leaves on the long green cells below, all the tiny mouths on the undersurface of the leaf become active. They suck in the carbonic acid gas, which is dissolved in the

water in the water cells and at once passes on into the long green cells. Here the green stuff separates the carbonic acid into its two parts—carbon and oxygen. The oxygen is breathed out again through the tiny mouths in the leaf, and the carbon, combined with the other materials carried to the green cells in the water, forms sugars, starches, new green stuff, and life-giving jelly to feed and build up the whole of the plant.

Plant factories begin work very early in the morning. As soon as the first rays of the sun fall upon the leaves all its little living cells wake up and start work for the day. As long as the daylight lasts work in "plant-land" goes steadily on—sap flows upward through the stems; carbonic acid gas is being sucked into the leaves; oxygen is breathed out; sugars, starches, and living jelly are being manufactured in the leaves, and sent through numbers of little pipes through the branches and stems to feed every part of the plant and build up fresh leaves, new shoots, flowers, and fruits. But as the sun sets the plants gradually stop working, and when darkness falls they are all at rest.

So you see that the sun is all-important to plant life. By its power alone can plants live and grow. Without the sun there could be no plant life, and without plant life nothing could live upon the earth. So we, and every living thing, depend for life upon the glorious sun.

But what happens to the plants when summer dies? How do the trees and shrubs live on through the winter-time when all the busy, active leaves lie scattered on the ground, and all the stems and branches are forlorn and bare?

All work has stopped in the plant factory, no food can be made, even the roots cease to drink when the days are cold and chill and the sap no longer flows. One would think the poor plants must die.

But no, plants, like the wise little hive bees, prepare for winter beforehand. In the summer days of plenty they work hard and lay up a sufficient store of food to supply warmth and nourishment in the winter, when sunshine is scarce and no fresh food can be manufactured, and to start work again in the spring.

Trees store their provisions in a special layer of the bark where it is safely protected from the frost. And when autumn comes to tint the leaves all red and brown and golden, the starches, sugars, and the very life of the leaf, are gradually drawn away into the tree till the leaves hang dry, shriveled and lifeless, upon the branches. Then at last they break away and flutter gently down to the ground or are whirled away on the wings of the wind.

The leaves do not fall off by accident when their work is done. While they are gradually giving up all their stores to the tree a number of soft, juicy cells are formed at the base of each leaf-stalk, building up a thin partition which slowly but surely cuts the leaf off from the bough on which it has lived and

WINTER OVERCOATS OF THE HICKORY

worked so bravely all through the summer long. At last the dead leaf is bound to the branch only by a few bundles of fine threads, and the slightest puff of wind, or even its own weight is sufficient to snap them and sever the leaf from the parent stems. When the leaf has fallen, the partition of cells spreads like a soft skin over the spot where the leaf-stalk joined the bough, and heals the wound so that the tree may not bleed to death.

If you look at the trees in the autumn after the leaves have fallen, you may see these little leaf-scars quite plainly; sometimes they are round, sometimes shaped like a triangle, a leaf, or a horseshoe; and just behind the scar you will find a little hard, dark knob. This is a baby leaf-bud warmly wrapped up for the winter in several little scaly coats. There it will sleep peacefully until spring awakens it to life; then it will swell and burst its wrappings, shake out its soft green folds in the sunshine, and be ready to take the place of last year's leaf.

The leaf of the horse-chestnut leaves quite a large scar on the twig when it falls to the ground. It is just the shape of a horseshoe, and has on it several little dots that look like the nails in the shoe. These are the marks made by the fine, threadlike bundles that held the leaf to the twig and which were broken through as it fell from the tree. It is from this curious leaf-scar that the tree has its name of "horse-chestnut."

Even when dead the leaves are not useless. Lying at the foot of the trees they gradually decay and form a layer of soft leaf-mold, in which the next year's seedlings may find a soft bed.

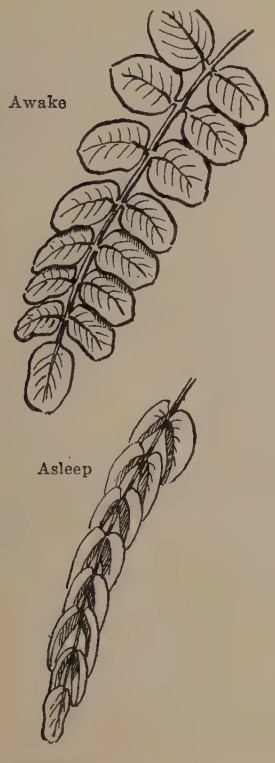
Different kinds of plants have different ways of providing for the winter. While trees and woody shrubs secrete their food-supply beneath the bark of their stems and boughs, other plants bury their stores in the ground—sometimes in roots like the carrot and turnip, sometimes in underground stems like the potato and the dahlia, or in fat bulbs like the crocus, daffodil, snowdrop, and other sweet spring flowers. Then the plants die down and retire altogether underground, where, secure from frost and snow, they sleep peacefully until spring calls them up again, and then they use their hidden stores to form new shoots and stems and leaves.

HOW PLANTS SLEEP

IT MAY sound strange to talk of plants sleeping, but they do sleep just as much as animals do. All living things, whether they are animals or plants, need a time of rest, so plants that have been working all day rest from their labors and go to sleep when night falls as truly as the birds, the bees, and the butterflies do.

Plants sleep most soundly in the winter-time, and so, too, do many animals. Many little creatures, and some big ones, too, go to bed when the cold days come, and do not show their noses out of doors again until the return of spring. The old tortoise in the garden buries himself in the ground or under a rubbish heap, the squirrel retires into a hole in an old tree, the dormouse curls itself up in a cosy nest of warm grasses, and numbers of beetles and snails burrow underground or bury themselves in the mud and slumber peacefully through the cold, dark months.

Before he retreats into his hole the squirrel hoards up a pile of nuts and acorns to last him through the winter; the sleek little dormouse, when he goes to his nest, has under his coat a good



LOCUST

LUPINE

ASTER

layer of fat to keep him alive and warm until he wakes up again. And does not the oak tree, when it draws in its stores under its coating of bark, and the crocus, when it retires underground into its well-stocked bulb, behave in very much the same way as the wise little animals? They collect a supply of food, hide it where frost cannot harm it, or hungry, prowling creatures steal it, and quietly go to sleep.

Almost all plants in cold or temperate countries go to sleep in the winter; even the evergreens, although they do not cast their leaves, are not really awake. They do no work in the cold days; no new shoots, no new leaves are formed. They have their supply of food laid by, but they keep it in their thick, glossy leaves instead of in their stems or roots, and the old leaves do not fall until the spring, when the new leaves burst forth and they are no longer needed. Notice the leaves of the laurel and the holly bush and you will see how thick and glossy they are. They are thick because they contain so much foodstuff, and glossy because they are covered by a thick water-proof skin to protect them from the frost.

But besides their long winter sleep most plants are accustomed to go to sleep every night all the rest of the year. I say most plants, for there are exceptions to this rule in plant-land just as there are in the animal world, and, like the owl and the bat and the night-flying moths, there are some flowers that turn night into day and wake up when everyone else has gone to bed.

Flowers usually go to bed very early. Before the sun has fairly set you will find the buttercup and the dandelion already closed for the night; some flowers indeed are so sleepy-headed that they fall asleep in the middle of the day, like "John-go-to-bed-at-noon"; others, besides the usual rest at night, take several little naps during the day as well, and close their petals every time a cloud passes over the sky.

The crocus, too, is a sleepy flower. It pops up from the ground very early in the year and bravely stands up against the cold east wind, and sometimes even driving showers of sleet. But the wise little plant is very careful to protect its delicate blossoms from the cold wind and sleet. Each bud is warmly wrapped up in a tight-fitting overcoat that looks as if it were made of tough tissue paper. While the days are cold and dull the bud keeps snug within its overcoat, but as soon as the sun shines warmly, it comes out of its wrapping and opens wide its golden cup. It is wide awake as long as the sun is shining, and the bees, who are only just out and about again after their long winter's rest in the hive, eagerly visit it and help themselves to its store of honey and pollen. But the moment the sun goes in the crocus proceeds to roll itself up like a furled umbrella and take a nap till the clouds roll by. The crocus may open and shut in this way half a dozen times a day; you see it is very much afraid that the rain may fall

into its cup and spoil its golden pollen, for the pollen is the flower's most precious possession, and it always does its best to guard it from harm.

All flowers do not sleep in the same way; many do not close, but sleep as it were with their eyes open. And lots of little flowers bend their heads at night, or when a rainstorm threatens turn their bright petals into tents or umbrellas under which the pollen is protected from cold and rain.

Leaves, too, settle themselves to sleep in different ways. Very young, tender leaves in early spring nearly always fold themselves up into little pleats and folds at night; they are warmer so, and not so likely to be frost-bitten; while laurels and other thick leaves of the kind do not trouble to fold, as they are not so easily injured.

If you look in the meadow late in the evening you will find that every little Dutch clover leaf has closed for the night. In the daytime its three little leaflets are widely expanded to catch every gleam of sunlight; but as the light wanes in the sky the clover leaf bends downward and folds one tiny leaflet over the other.

The pretty little wood-sorrel that grows in woods and other shady places behaves in much the same way. The plant has a sweet little flower, white, streaked with lilac, and its leaf is divided into three leaflets like a clover leaf. Both flowers and leaves bend sleepily down and fold themselves up when they go to bed at night.

The leaves of the graceful acacia tree go to sleep even more soundly. Each leaf is divided into many little leaflets, and at night these fold tightly over one another and the leaves hang down like lots of little bits of string, or like the tails of Bo-peep's lost sheep which she found "all hung on a tree to dry, oh!"

Now when plants are awake in the daytime, we know that they are taking in carbonic acid gas from the air and giving back the oxygen (or most of the oxygen) it contains to the air again. In this way growing plants help to purify the air. All living things need oxygen, nothing can live without it, but plants do not need nearly so much as animals do, so when plants are giving out oxygen they are doing us good service, for the more oxygen there is in the air the better it is for us to breathe. But at night when the plants sleep they no longer give out this oxygen from their leaves; then they breathe out carbonic acid gas just as animals do, and this is why it is good and healthful for us to be in the daytime where trees and plants and green grasses are growing, but bad to have plants in our rooms at night.

HOW PLANTS ARE PROTECTED

Not only do plants struggle with one another for sunlight and air, water and elbow room, but they have also to hold their own against living creatures of another kind. They are in constant danger of being eaten up wholesale by the hoards of insects, snails, and hungry grazing animals that are always nibbling and munching the fresh green leaves and young tender shoots.

Most insects and snails, and by far the greater number of wild animals, feed entirely on plants of one kind or another. Insects swarm on the trees and bushes and plants, and would, if they were not kept in check by other insects and the useful birds, strip them of all their foliage; deer and hares and rabbits, to say nothing of mice, are always nibbling away at all the green leaves and juicy shoots they can manage to reach; and even squirrels, although they feed on nuts, acorns, and beach-mast, will bite the buds and break off the shoots of the trees for sheer mischief; while as for the slugs and snails, they have the most enormous appetites and devour almost every green thing they can find.

Against the attacks of all these six-

CHICKADEES EATING INSECT EGGS

PINK CARNATIONS

PROTECTION

legged, four-footed, and one-footed creatures, the plants must need defend themselves as best they may; for if they just stood still and allowed themselves to be eaten up, many of the weaker, slow-growing kinds would be killed off altogether.

Of course plants cannot actually fight against their destroyers in the same way that animals can fight; neither can they run away; nevertheless they have many ways and means of protecting themselves against their greedy enemies. Some plants have such a very unpleasant smell that very few creatures will touch them; others have poisonous juices which sadly disagree with those who eat them, and few animals are foolish enough to try them a second time; others again have a nasty, sour, or biting taste, which makes one mouthful quite enough for most animals, however hungry they may be. And although, to be sure, there are certain insects which do not mind these bad-tasting, disagreeable plants, but in fact seem rather to enjoy them than otherwise, most creatures have learned to leave them severely alone.

But it is not always by making themselves nasty and unpleasant that plants protect themselves against their natural enemies. A great many are provided with defensive weapons in the shape of sharp spines, thorns, or prickles, that wound the tender mouths of animals which rashly attempt to bite them; or have bristles or stinging hairs which hurt the large soft foot of the greedy snail.

When we try to pick the honeysuckle or some nice ripe blackberries growing over the hawthorn hedge, we must be careful not to get our hands and wrists badly scratched with the sharp thorns on the hedge and on the brambles. The spines of the hawthorn are quite long, stiff spikes and spring from the branches at the base of the leaves—just where they would easily pierce the lips of any animal who tried to nibble the foliage—while the long stems of the blackberry brambles are studded with sharp, curved thorns like little hooks, which serve both to help the plant to clamber over the hedge and to keep off unwelcome intruders.

Whenever we gather wild flowers, whether in lane or meadow, on heath or common, we have to be careful that we do not hurt ourselves by brushing against some thorny or prickly plant. Thistles of many kinds, that stand up defiantly on every piece of rough ground, simply bristle all over with spines as sharp and as fine as needles, as we often find out to our cost. Not only have they prickles on their stems, but the leaves too are armed with alarming-looking spines. Sheep and rabbits nibble the grass all round the thistles, but do not touch the prickly things, and no snail or slug dare set foot upon them.

The holly is another plant protected by having very prickly leaves, and its foliage is very seldom eaten; and you will see if you look carefully at a holly bush that while the leaves on the lower part of the bush are terribly spiny, those growing near the top have quite smooth edges, for these are above the reach of grazing animals, and do not need defensive weapons.

Thistles and brambles and such spiny plants boldly display their thorns and spikes and prickles as much as to say, "touch me if you dare"; but the nettle is a cunning plant, armed with secret weapons, and to those who know no better it appears to be quite a harmless plant. The soft hairs which cover its leaves do not look at all alarming, but anyone who has once touched them will certainly not wish to do so a second time. If we look at one of these hairs under the miscroscope we will know better why their touch is so painful. When the stinging hair of the nettle is much magnified we see that it is long and thin, and tapers to a very fine point. At the base of the hair is a sort of little cushion, while the hair itself is hollow and filled with an irritating, poisonous fluid. Now when you touch a nettle quantities of these tiny hairs, which are very brittle, are broken off. They pierce your skin and the poisonous fluid is poured into the punctures, making a painful, burning patch on your hand or arm.

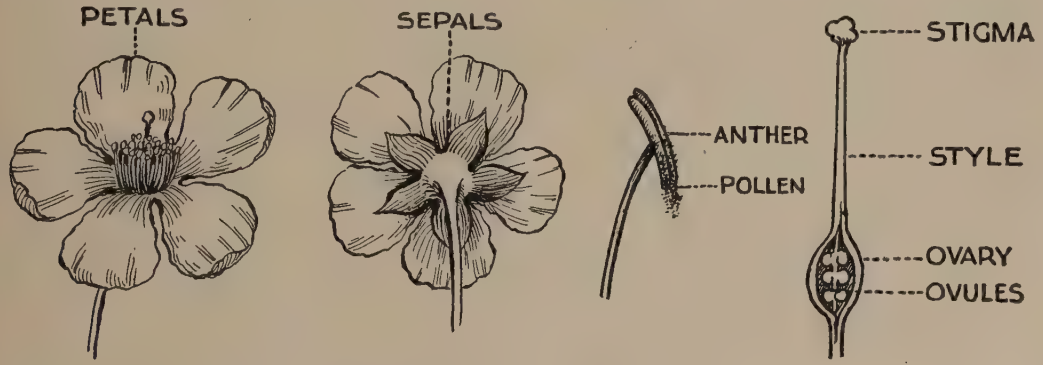
The stinging hairs all lie on the leaf in the same direction pointing toward the tip, so if the nettle is grasped firmly in a certain way the hairs will not break into your skin and you will not be stung. But unless you know exactly how to do this, I think it is wiser not to try the experiment.

I daresay you wonder why all plants

are not protected, why some taste nice and some taste nasty; why some have thorns, spines, or stinging hairs, and others are soft and smooth. Well, all plants do not need protection in the same degree. Most trees hold up their leafy branches well above the ground, out of the reach of grazing animals. To be sure they are often attacked by insects, but birds help to keep these enemies down, and the trees, as a rule, are able to put forth new leaves quickly enough to take the place of those that have been devoured.

Grass is always being cropped short by cattle, sheep, and rabbits; but most grasses are very strong plants; as fast as the green blades are eaten away fresh supplies are sent up from underground stems to replace them, and so grasses manage to live in spite of the numbers of creatures which feed upon them.

Neither must you think that all protected plants escape scot free. They don't. In spite of their various defenses there are generally some hungry creatures who defy them. Rabbits will nibble holly leaves, and sheep and cattle injure the bark of trees; the caterpillars of the peacock and tortoise-shell butterflies are particularly fond of stinging nettles, and even the prickly thistle is often devoured by the donkey. But these spiny, prickly, and unpleasant plants have not so many enemies to contend with. Only a few creatures are bold enough to attack them; and so they stand a better chance of success in the struggle for life.



THE DIFFERENT PARTS OF A FLOWER AND THEIR USES

Before we talk about the many wonderful ways in which plants look after their children, let us first examine a flower and see what it really is. I am not going to worry you with a lot of difficult names and long explanations, for this is not a botany book, but a little book to tell you of some of the wonderful and interesting things that happen in "plant-land"; but there are

one or two things we must know about flowers, or else we shall not understand what we are talking about.

If we pick a buttercup and look at it carefully, we shall find that this pretty yellow flower is not all in one piece, but is made up of several parts, all very different one from another.

In the very center of the buttercup are a number of tiny green knobs set closely together, each one on a short stalk which swells out at the base into a plump little sack. These are called carpels, and all together they are spoken of as the "pistil."

Round the pistil are several rows of slender threads, with long, thick heads —like a lot of long-headed pins all stuck into a pin-cushion in neatly arranged circles. These are called "stamens."

Outside the circle of stamens are five soft, bright yellow leaves. These are the "petals" of the buttercup, and together they are called the "corolla" or cup of the flower.

Behind the yellow petals come five small leaves, which are green, and (this depends on which kind of buttercup you are looking at) may either spread out in a circle below the petals or curve backward with their points almost touching the stalk of the flower.

Now what is the use of all these parts? Well, the pistil is the seed-bearer. In the little sacks at the base of the pistil the seeds, which are really the eggs of the plant, are formed.

The stamens are the pollen-bearers. Their long heads are really little bags full of golden pollen grains as fine as the finest dust.

When they are ripe the little pollen bags split down their sides, and the golden grains are scattered abroad, and before the seeds of the flower can ripen each little knob in the pistil must be dusted with some of the pollen dust—to "set" the seed.

The pistil alone cannot make the seeds grow, and the stamens alone cannot either. The two different parts of the flower must work together before the children of the plant are born.

To understand better how this comes about let us look once more at the pistil of the buttercup, in which the tiny seed buds lie waiting—waiting for the magic touch of the pollen grains to move them to life, just as the Prince's kiss roused the Sleeping Beauty from her sleep.

We shall find, if we cut open one of the carpels of the pistil, that the short stem, which connects the tiny knob with the seed sack, is hollow. Now when it is ready to receive the pollen the little knob (which is called the stigma) becomes very sticky, so that when a pollen grain falls upon it, it rests there and does not blow away.

As soon as the pollen grain rests on the stigma it begins to grow. It puts forth a slender stem called a "pollen tube," which pushes its way down the hollow stem of the carpel until it reaches the wee seed bud below, and at once the seed bud quickens into life and begins to grow and ripen.

If no pollen falls on the stigma the seed buds cannot set. The pistil will

be useless; it will wither away, and there will be no children in that pretty flower nursery.

This seems very strange and wonderful. And so it is. The setting of the seeds is one of the most wonderful things in the world.

The stamens in all flowers are not exactly alike; the stems may be long or short, and the little pollen bags all sorts of shapes and sizes. Some are like hammer-heads, some like little boxes with lids which open to let out the pollen; they may be egg-shaped, curved like a ram's horn, curved and curled in all sorts of fantastic ways, or stand up straight like a pikestaff. The pollen dust may be golden or different shades of yellow, and it is sometimes white, gray, or a deep red color.

The pretty bright petals, all blue or yellow, white, pink, red, violet, or spotted and striped with different colors, are the nursery walls, as it were, surrounding and protecting the seed buds which lie in the heart of the flower.

The petals are the most beautiful part of the flower, and they are very important too, but not so important to the flower as the pistil and the stamens; indeed, a great many flowers do without petals altogether, and are such small, colorless things that you pass them again and again when you are out in the country and do not recognize them as flowers at all. The grasses, the nettles, the oak tree, and quantities of other plants have tiny, inconspicuous flowers with no bright petals to attract our attention. But such flowers do not need them; their habits and customs are quite different from those of their more brilliant neighbors that are so gayly clad in their pretty petals.

The use of the calyx, or outer cup of the flower, is to cover up the flower and keep it safe and warm while it is in the bud. It also serves to guard the flower from the attacks of ants and troublesome beetles, which would break through and steal the pollen before it is ripe and ready to set the seeds. So sometimes we find the sepals are turned backward, making a sort of lobster pot which prevents any little thieves that crawl up the stalk of the flower from getting any further, and sometimes they are thickly covered with hairs which, although they seem very soft and harmless to us, are dense impenetrable forests to unwelcome insect visitors.

The sepals are usually green, but sometimes they are as brightly colored as the petals—in a fuchsia, for example. The sepals may be separate leaves like those of the buttercup, or they may be joined so that they form a little cup, like the calyx of the blue harebell, the white dead-nettle, and the sweet pea.

Plants do not believe in keeping anything that is of no use to them, so if the sepals are no longer needed when the flower has opened, they often fall off; but sometimes they stay on after the petals have fallen to protect the fruit of the flower.

Now the most important thing in the life of a flower is the setting of its seeds, and to bring this about flowers

take all sorts of trouble, and have many curious and interesting ways of making sure that their stigmas shall be dusted with pollen.

But why take trouble? you ask. Surely when the stamens are ripe, and the flowers sway in the breeze, the pollen will be shaken over the pistils and the thing is done.

Well, this does happen in some cases, but not in all. Flowers which set their own seeds are, as a rule, rather poor things. Nearly all the better, higher plants do not want their seeds to be set by pollen from the same flower—indeed they do everything they can to prevent such a state of affairs.

So in some flowers we find that the stamens and the pistil do not ripen at the same time. Sometimes the stamens ripen and scatter their pollen dust before the stigmas are ready for it. Sometimes it is the other way round—when the stigmas are ready the pollen is not ripe and is still shut up close in the little pollen bags.

Some plants go a step further than this, to make quite sure that their flowers shall not set their own seeds. They do not carry their stamens and pistils in the same, but in *separate* flowers. Oak trees and pine trees, for example, bear some flowers which have stamens but no pistil, and some flowers which have a pistil but no stamens. Willows are even more fussy and particular about the matter, so we find that one tree will have nothing but seed-bearing flowers, while only pollen-bearing flowers are grown on another.

Yet flowers, as we know, must have pollen to ripen their seeds, so the problem these very particular plants have to face is how to transfer the precious grains from one blossom to another.

Now plants do many wonderful things, but they cannot possibly march about and shake the pollen out of one flower onto another. So they have to do just what we should do if we wanted to give a present to someone but could not take it ourselves—they must send it by carrier. And the carriers in plant-land that carry the pollen from flower to flower are the busy bees, the bright butterflies and moths, the gauzy-winged flies, certain little beetles, and the wind; while in the bird-world the lovely little humming birds, the sun-birds, and the quaint little brush-tongued lories often play the part of parcel-postmen to the gorgeous, tropical flowers.

So by means of the insects, the wind, or the birds, the pollen is carried from flower to flower. It is a wedding present from one blossom to another—and this is how in plant-land the flowers are married.

Now when we send birthday, Christmas, or wedding presents to our friends we have, of course, to pay the carriage, and the rule is just the same in plant-land. The wind, to be sure, asks no payment for its services; but the insects, which are the chief pollen-carriers, cannot be expected to work for nothing. They must be rewarded for their trouble. So almost all gayly colored flowers keep a gift of honey for their errand-bearers.

THE WIND AND THE FLOWERS

FLOWERS that depend upon the wind to carry their pollen from one to another are very different in many ways from the dainty blossoms whose seed is set by the little insect helpers. The wind needs no honey to reward it for its services, it takes not the least notice of bright-colored petals or sweet scents. So as honey, sweet scents, and pretty colors are no use to them, the flowers do not trouble themselves about such things, but spend their energy in other ways to make sure that when the south-west wind comes blustering by it shall catch the clouds of golden dust and blow it away to neighboring flowers.

What the "Wind-flowers" need more than anything else is plenty of pollen, for the wind is a careless carrier and is quite sure to waste a great deal of the dust which the flowers entrust to his tender mercy. The stamens, too, must hang out their pollen bags in such a way that they may be shaken, and the pollen scattered by every breeze that passes by; while the stigmas of the seed-bearers must not hide themselves away in dainty cups and bells, but must stand out boldly and make themselves as fluffy as possible in order to catch and hold the pollen grains as they come floating by on the wings of the wind.

So we find that while flowers whose seeds are set by insect visitors are nearly always—

1. Brightly colored or scented.
2. Have usually a store of honey to reward the insects for their labors.
3. Produce only a moderate supply of pollen.
4. Have, as a rule, quite small stigmas.

Wind-set flowers are—

1. Small and inconspicuous.
2. Have no scent or honey glands.
3. Produce quantities of pollen which is very dry and powdery.

BIRCH CATKINS

4. Have large stigmas that are often feathery, or like fine, sticky threads.

Everywhere on our country rambles

shall we find these modest little wind-set flowers.

Long before the forest trees put forth their fresh green leaves, they hang out their bunches of strange little flowers—which we call "catkins." For the trees are anxious that the seeds shall be set

PUSSY-WILLOWS HAVE STORES OF SWEET HONEY TO SELL

before their branches are covered with foliage, as the leaves would be very much in the way, and prevent the pollen being carried properly from flower to flower. The catkins are generally long and hang down like little tassels from the branches, so they are easily moved by the wind and the pollen is shaken out of them in regular showers.

The pollen-bearing catkin and the seed catkin sometimes grow together on the same tree, but sometimes a tree will bear only one or the other.

The hazel has very fine catkins which look rather like little brown sausages. Each one is made up of a number of tiny flowers, and every little blossom is covered with a little brown scale—for as the flowers come out so very early in the year, they need some protection against cold and frost. The brown scales overlap one another slightly like the tiles on the roof of a house, and underneath each one lie about eight little pollen bags ready to shake out their pollen when the wind tosses the catkins about.

The seed-catkins grow on the same tree. They are funny-looking little things, like plump, scaly buds, from the end of which the red stigmas stick out in feathery tufts. When the pollen from the longer catkins has been carried to them by the wind from a neighboring tree, these plump little things will begin to swell, and will gradually turn into the sweet hazelnuts for which we go nutting in the autumn.

There is nothing to tempt the insects in these funny dry catkins, so the hazels and most forest trees must needs depend on the wind to set their seeds. But the "pussywillows," as we call the soft, fluffy catkins that grow on the willow trees, have stores of sweet honey to sell; so their pollen is carried for them by the bees who come flocking to the feast attracted by their silvery scales and bright yellow stamens. And if you stand under a willow tree in the early spring you will hear the joyous hum of the bees

as they sip the honey and sprinkle themselves with pollen among the branches up aloft.

Nearly all grasses have their seeds set by the aid of the wind. The flowers, though small and dry, are often pretty and graceful, clustered together in feathery spikes or "panicles" at the top of long, slender stems that bend and sway with every breeze, shaking out the powdery pollen from the stamens to be wafted away to the flowers of a sister plant.

To the grasses belong some of the most useful food plants—wheat, barley, oats, and rice are all grasses, and their pollen is carried from flower to flower on the wings of the wind.

SEED NURSERIES

When a flower has set its seeds, the honey glands dry up and the pretty, bright petals wither away or fall to the ground, for they are no longer needed to attract the attention of bees and butterflies. But the pistil remains fast to the top of the flower-stalk, and in this tiny nursery the little seeds—the children of the plant—grow and ripen.

Now when we speak of fruit we generally mean something that is sweet and juicy, such as an orange, an apple, a cherry, or a plum; but the seed-nurseries of all flowers are really fruits, although they are most often nothing but dry pods or capsules, that are not at all good to eat. A pea pod or a poppy head is as much a fruit as a pear or a strawberry. All fruits, whether they are sweet and juicy, or hard and dry, are specially grown by plants as nurseries for their children.

Some flowers have hundreds of children, others have much smaller families, and in some flower-nurseries only one plant baby is sailing through the air in balloons, in parachutes, in airplanes, and dainty little aircraft of all descriptions.

In the seed-time of the year we may see hundreds of these airy voyagers floating lightly in the breeze, or being whirled away in the rush of the wind. The slightest puff of wind lifts the dandelion clock from its stalk where all the feathery seeds have been clinging

WEED SEEDS

together in a round glistening ball, waiting until all are ready to start on the journey through the air. Then the clock breaks all to pieces and each separate seed sails away alone, borne up by the most beautiful feathery parachute, like a tiny white umbrella turned inside out. And these plant babies will often travel miles away before they come down to earth again. The thistledown, too, floats ever so far over fields and meadows, sometimes right into the heart of busy towns and cities, to settle down, perhaps, in some little back garden. These little airships will even cross the water, and, should the wind be favorable, may fly from country to country and establish themselves on foreign soil.

The willow pods burst open, and quantities of little cottony seeds make their escape and sail merrily away on the wind. The same thing happens to the willow herbs, indeed the air is full of these floating plant babies—the children of each different kind of plant having their own particular pattern of air-machine.

Some plant babies are fitted with wings with which they fly or flutter away as far from the roots of the parent plant as the wind will take them. Sometimes it is the fruits and sometimes it is the seeds themselves that are winged. Watch the "keys" of the maple as they break from the tree on a windy day and go whirling and dancing down the lane. Try to catch them as they fall. You will not find this easy. For the curiously shaped wings of the keys cause them to spin round and round like tops in the air, and every puff of wind sends them spinning farther away.

The maple key is a double fruit, and each flat, twisted wing contains a seed. The birch, the elm, and the ash trees bear one-seeded little fruits or "nuts," each one surrounded by a flat papery wing which buoys up the little voyager when it starts off on its journey, and prevents it falling to the ground too soon.

In the pines it is the seeds that have wings; each seed has only one, which acts as a sail, and sends it spinning through the air, when once it has escaped from the strong wooden box in which it has been shut up for so long a time. For pine trees do not send their children away as soon as the summer wanes, as most plants do, but keep them hanging on the trees in the pine-cones for quite two years before they allow them to go out into the world to shift for themselves. Pine trees have two kinds of cones—pollen-bearing cones and seed-bearing cones. The pollen cones never grow very big, but the seed cones on some pine trees grow to an enormous size and would be terrible things if they fell on your head. Until its seeds have been set the cone points upward, the better to catch the pollen which is carried to it by the wind, but when this is accomplished it begins gradually to bend over until it finally points downward.

Within the cone are many little chambers, each containing two pine seeds, and each little nursery is covered by a hard, woody scale which acts as the nursery door. For two long years the doors

are tightly shut, but at last when the time arrives to set the little prisoners free, they open from below, and the pine seeds come tumbling out and flutter away in the breeze. Sometimes the whole cone falls to the ground with a thud, scattering the seeds from its open doors, and the wind catches the little sails of the seeds and whirls them away to new ground.

So in one way or another the plants provide for the future welfare of their children, sending them forth like little emigrants to new soil, so that they may stand a fair chance of springing up on some spot where plant life is not too crowded. They set off on their journey by balloon, parachute, and airplane; they ride off on the backs of wandering animals; they are carried by birds; shot forth from their nurseries as from spring guns; tossed afar by the wind; or rolled along the ground. Some even travel by water, but only a very few, as most seeds and fruits sink very quickly. But the fruits of certain palm trees float out to sea enclosed in a water-tight envelope which contains a supply of air to keep them buoyed up on the water. The large coconuts, too, often put out to sea safely wrapped up in a thick mass of loose fiber enclosing a quantity of air, which keeps them afloat on the waves just as well as a cork jacket would.

HOW THE PLANT BABIES ARE SENT OUT INTO THE WORLD

On a bright, sunny day in "golden October," when the yellow corn is ripe and the woodland trees are just beginning to put on their autumn dresses of brown and red and yellow, as we go nutting in the hedges and copses, or gathering great bunches of purple heather or goldenrod on the open, wind-swept heaths and commons, we may hear—if we stand quietly and listen for a moment—many strange little pops and cracking sounds going on all around us, as if the wee, woodland fairy-folk were hiding under the foliage and firing at us with tiny guns. But you need not be alarmed, for it is only some of the plants nearby saying "good-by" to their children, and sending them off in a somewhat hasty manner to fend for themselves in the world.

For instead of shaking their seeds out of their nurseries a few at a time, like the poppy and the foxglove, many plants prefer to get rid of them all at once and have done with it. So when the seeds are ripe and ready, the seed cases, which have been getting very dry in the sun, suddenly explode with a "pop" and the seeds are shot out in all directions.

The yellow broom adopts this method of disposing of its children, and all through the warm autumn days you may hear their dry seed pods popping away as the seeds are shot forth to fate or fortune.

The little wild geranium and the vio-

let that hides in the wood behave in this startling fashion, too, although they are such meek-looking little flowers one would hardly expect it of them. The seed case of the violet is really very curious. When ripe it opens into three parts, each one shaped like a tiny boat and containing a double row of highly polished and slippery seeds. As the sides of the boats dry they shrink in the sun and press against the seeds, which are flung violently out into the air. To understand how this happens just squeeze an orange pip tightly between two of your fingers and you will see how it springs out from between them.

But strange as these little plants are, they are outdone by the curious exploding plants that grow in hotter climates. The sand-box tree of the West Indies has very large round fruits containing several seeds about as big as a horse-bean. When ripe this "box" suddenly bursts like a bombshell, making a noise like the firing of a pistol; and should any unfortunate people be passing the tree at the time they are likely to be seriously hurt by being bombarded with the large hard seeds.

The squirting cucumber is another of these most startling and extraordinary fruits. It is found growing on waste land in many parts of southern Europe, on trailing vines which creep over the ground. The cucumbers are small and green and hairy and do not look at all as if they were dangerous in any way; but if you touch one of these funny little things it instantly bounces from its stalk, flies in your face, and spatters you all over with seeds, soft pulp, and a quantity of disagreeable juice, which stings like red pepper if it gets into your eyes.

The reason why these strange little squirting cucumbers behave in this very rude fashion is that they want to scatter their seeds as far as possible and also to frighten off browsing animals, such as cattle and goats, and prevent them feeding on the vines; for of course no animal likes to be struck in the face by a hairy, stinging cucumber when it thinks it is going to have a nice sweet fruit; and it will very rarely venture to touch one a second time.

Many plants tempt the birds with sweet fruits or nice berries to help them to distribute their seeds. So fruits and berries are nearly always brightly colored and conspicuous to attract the attention of these little feathered helpers—just as the petals of flowers are bright and pretty to induce insects to visit them. The rosy-cheeked apples in the orchard, the scarlet berries on the holly tree, the crimson hips and haws upon the hedgerows, are one and all intended as feasts for the birds, to persuade them to scatter the seeds within the fruits on fresh ground.

The birds eat the sweet pulp of the fruit, or the nice soft berries, but they cannot digest the seeds, because they are protected by hard, stony jackets, like the seeds in plums or cherries, or are wrapped up in tough skins like the "pips" in apples and pears. So the seeds of the fruits are thrown away or dropped by the birds to the ground—

just as the trees or plants on which they grew intended they should be. And in this way the birds of the countryside help the plants to sow their seeds on fresh ground.

But not all plants reward their helpers by giving them something good to eat; many compel all sorts of creatures, generally four-footed ones, to carry their seed away, whether they will or no, and give them nothing at all by way of payment for their services. The seeds or the fruits of such plants are provided with prickly coats covered with little curved hooks or bent hairs—like the tiresome little burrs you find clinging so fast to your clothing when you have been nutting or blackberrying. These prickly burrs catch in the woolly or hairy coats of sheep and other animals that happen to brush up against them, and so are carried away. And to get rid of these annoying things the animals, as they wander about from one place to another, scratch and rub themselves on bushes, trees, and fences until at last the burrs are rubbed off—perhaps ever so far away from the spot on which they grew. The goose-grass or beggar's lice sends its children forth into the world like this. It has a little double fruit covered all over with hooked prickles. And the hound's-tongue, a plant with a purple spotted flower that grows by the wayside, has adopted the same clever way of compelling animals to carry its seeds away.

In hot countries these prickly fruits often bristle with such strong, sharp hooks that they are really dangerous things to touch, and poor animals are often very much hurt by them. The African grapple-plant has a very curious clinging fruit of this kind. With those long curved hooks it "grapples" the coats of passing animals so firmly that they are often forced to carry it for miles before they are able to get rid of it.

WITCH HAZEL

More extraordinary still is the fruit of a kind of wheat that grows on the edge of the Egyptian deserts, for it actually tricks birds to make them carry

it to fresh ground. The fruit is long and hairy and at a little distance away looks not unlike a young green locust, two long, bent bristles doing duty for the insect's long hind legs. As the hot sun pours down upon it this strange fruit expands and contracts, twisting and wriggling in a very insect-like way, and sooner or later a hungry bird is sure to pounce down upon it, and carry it off, thinking it has found a nice fat locust. But finding it has seized nothing but a dry hairy husk, the bird soon drops its prize again in disgust; and then, as the dry fruit continues to wriggle and twist upon the ground, it is almost sure before long to wriggle itself into a crack in the hard-baked ground—where, when the rain comes to soften the soil, the seed will be able to take root.

But there are a great many plants that wish to have nothing to do with birds or beasts. They will not trust them with their seeds, but do all they can to prevent hungry creatures from touching them. For many seeds are so rich and good that the birds and beasts would eat them right up instead of throwing them away. So some plants surround their seeds with hard shells—these we call nuts; the chestnut protects its seeds with prickly coats; and other plants put bitter or unpleasant-tasting coverings round their seeds to make animals leave them alone. They don't always succeed in doing this altogether though, for monkeys and squirrels know how to crack the nuts to get at the kernels. But they don't eat them all. And the squirrel at any rate often, unintentionally, helps the trees by sowing the nuts instead of eating them; for this funny little animal has the habit of burying little stores of nuts in the ground and then quite forgetting where he has hidden them.

THE GROWTH OF A BABY PLANT

But what of the little seeds when they have set out on their voyage of adventure? Well, a great many perish by the way. They may be destroyed by birds, beasts, or insects, or they may never find a spot on which they can grow. They may be blown into streams and rivers, or they may come down on hard, stony ground, where there is no soft soil to rest in.

But all are not so unfortunate. A fair number of the plant babies settle down on suitable ground, where they soon become covered over by the soil. There, through the winter months, they rest safe from the cold and frost till the soft spring rains and the warm sun rouse them to life.

Then each little seed will begin to swell. It bursts its seed-coat, and sends forth a delicate white root, which pushes its way downward into the ground, and a pale green shoot which grows upward, pushing its way up to the light and air. No matter in what position the seed may lie its root will always grow down and its shoot will always grow up. Even if the seed is turned upside down

after it has begun to sprout, so that its root points upward and its shoot points down, it will not stay like this, but the root and the shoot will at once begin to twist and curl themselves round, and before very long they will have returned to their right position again. Nothing will induce a plant to send its roots up into the air and its shoots down into the mold.

At the top of the shoot is a little leaf-bud, and the tip of the root has a tiny root-cup to protect it from injury as it pushes its way down through the soil.

Besides the root and the shoot a seed has always a nice packet of food stored away under its seed-coat—enough to last the little seedling until it is big enough and strong enough to put forth leaves and manufacture food for itself. The food so thoughtfully provided by the parent plant for its children is stored up in two fat leaves, which fill up the whole of the seed, and between these two "seed-leaves," as they are called, lies the perfect little baby-plant—ready to push forth its shoot and root as soon as the proper time arrives. The seeds of a great number of plants have two seed-leaves, but others have only one, and their first supply of food is packed up in rather a different manner.

Well, the root grows down and the shoot grows up, and the little seedling feeds on the starches and other food-stuffs with which its two seed-leaves are packed, so the first leaves gradually shrink and shrivel up. But by the time it has eaten up all its store of food the little plant has put forth a fresh pair of green leaves, and is now ready to work for its living and provide food for itself. The leaves suck in carbonic-acid gas from the air with their hundreds of tiny mouths; the roots send up water with the nourishing salts of the earth dissolved in it. And the sun shines on the leaves and by its power the carbonic-acid gas, mixed with the water, is converted into starches and sugars and living green stuff to feed and quicken the whole plant.

The seedling is at first a very delicate little thing, and for some time is in danger of being trampled down by animals, plucked up by birds, or of having its tender young shoots and leaves devoured by hungry insects. If it happens to have started life in a crowded place, it must struggle with the other plants for water and air and sunshine, for without these things no plant can live; and unless the little seedling is quite as strong and healthy as its neighbors, and can hold its own in the fight, it will surely be overgrown by the more sturdy plants and so be starved for want of light and air. But if all goes well, and the seedling survives all these dangers, it will grow and flourish, put forth new shoots and leaves, and in time itself bear flowers, fruit, and seed.

"If people had never seen little seeds grow into great plants and trees, of quite different shapes from themselves, and these things again produce fresh seeds, to grow into fresh trees, they would have said 'The thing cannot be; it is contrary to Nature.' "

Yet, because this marvelous transfor-

mation is going on for all eyes to see, and we know that the mighty oak tree sprang from an acorn, and that the tiny hard seeds we sow in our gardens will grow into lovely flowers, we are apt to forget how very wonderful this is. But the more we learn about plants, and the more we study their ways, the more interesting and wonderful shall we find them; and our gardens will give us more pleasure and our visits to the country will be full of new interest and delight.

ROBBER PLANTS

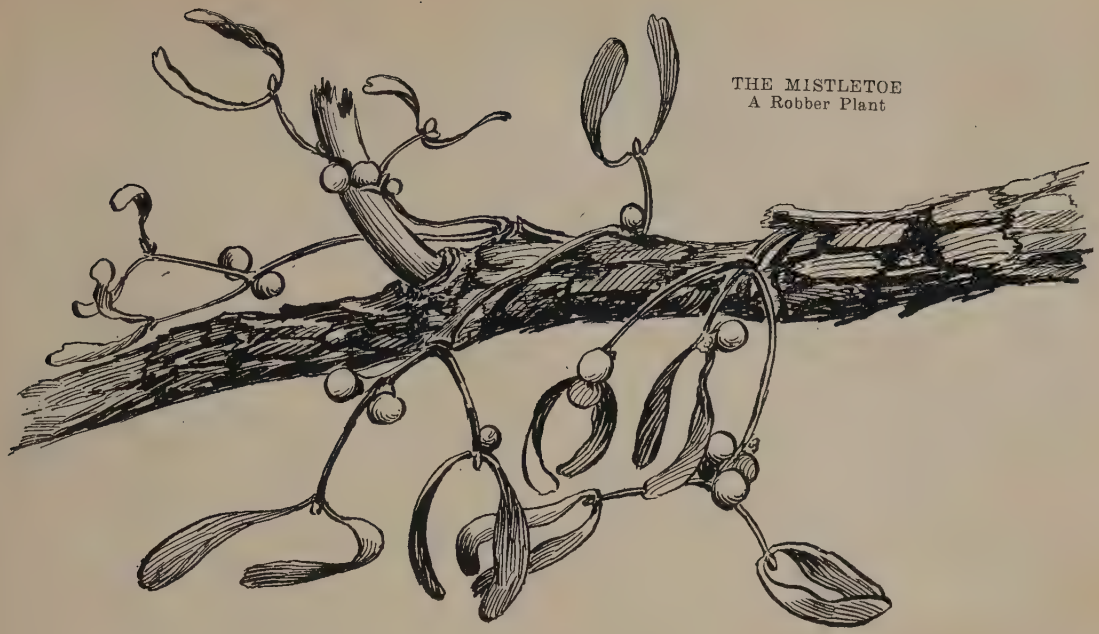
THERE are a number of curious plants that are regular thieves, and spend their lives in robbing other plants. These plants are called "parasites," for the word parasite really means an uninvited guest who turns up regularly just as a meal is served, and takes other people's food without paying for it.

These plants do not all belong to the same family; most of them have relations which are honest, hard-working plants; and indeed they themselves (or rather I should say their ancestors) in days gone by behaved like ordinary plants, and manufactured their own food from the material supplied to them by the air and the sunshine. But after a time these plants became lazy, and they found that if they could steal a little food from others they need not work so hard. So gradually the lazy plants worked less and less, and at last many of them became altogether dependent on others. They lost their green leaves, and it became quite impossible for them to work for themselves, and now most of these parasites would quickly die if they could not find a green plant to support them. And this just shows what a very bad thing laziness is, and how difficult it is to cure when once one gives way to it.

Of course, plant parasites are not all equal in this respect. Some still retain their green leaves and are capable of doing a certain amount of work for themselves, although they draw their chief supply of nourishment from their "host," as the plant is called upon which they fasten themselves. Others have lost all their leaves and contain no green stuff at all; these, of course, are altogether helpless, and must find all their food ready made. Between these two extremes there are robber plants of varying degrees.

Neither do they all behave in exactly the same way. Some perch themselves aloft among the branches of trees; others wind themselves like snakes round and round the stems of their unwilling hosts; others are root thieves, and fix themselves for life on the roots of other plants.

We may find several of these robber plants in the fields, in the lanes, and in the woods; but they need hunting for, for as a rule it is not to their advantage to make themselves conspicuous.



THE MISTLETOE
A Robber Plant

THE MISTLETOE

Quite a different kind of parasite is the mistletoe. It does not fix itself to the roots of plants or twine about their stems, but perches aloft on the topmost boughs of certain trees, and takes toll of the sap circulating through the branches.

The mistletoe is not quite so shameless in its ways as some of the other robber plants we have talked about. It has green leaves of its own, although from their yellowish tint one can tell that the plant is not too fond of work; for healthy, hard-working leaves are always a true green color, except in a few cases, when they are red like those of the copper beech.

How do you think the mistletoe gets into the branches of the trees? Well, the seeds of the plant are sown there by the birds. Birds are very fond of the juicy white berries that are most conveniently ripe in the wintertime when food is scarce.

Now, when a bird has been feasting on mistletoe berries, some of the seeds they contain are almost sure to stick to his beak, and to get rid of them the bird cleans his beak by rubbing it on the branch of a tree. So, here and there, a mistletoe seed is left sticking to the branch of a tree, and by and by the baby plant within it bursts its seed-coat, and sends out a little root which firmly cements itself to the bark. The rootlets of the mistletoe plant never coil round the branch, but run straight up and down it, and at intervals a "sinker," as it is called, pierces through the bark right down to the wood, and by these sinkers the sap of the tree is sucked up by the mistletoe. The root of the plant

is very much the shape of a rake—the long straight root being the cross-piece of the rake, and the sinkers which pierce the bark, the teeth.

The mistletoe's favorite tree is the black poplar. Wherever there is a small plantation of black poplar trees, there you are sure to find the mistletoe growing. It also establishes itself on apple-trees and pine trees, and sometimes, though not very often, it perches upon walnut trees, pear trees, almond trees, elms, white thorns, and willows; very seldom is it found upon the oak.

When once the mistletoe is firmly fixed to a tree, it will go on growing for a number of years, and if the tree is strong and healthy and has an abundant flow of sap, then the mistletoe will flourish exceedingly and in time become a fine large bush. But should the tree on which it is perched be poorly supplied with sap, then the mistletoe will be stunted and sickly, so much does it depend for nourishment upon its host.

A mistletoe plant may live for forty years, and if circumstances are favorable it may send out shoots in all directions from which new plants will spring, so that in time a tree may have every one of its branches covered with mistletoe, and birds build their nests in the bushes.

It is no use cutting a mistletoe plant from the branch of a tree, for the long roots which are fixed by their sinkers to the tree send out new shoots without loss of time, and after two or three years there will probably be a dozen bushes growing from it instead of one. Cutting the mistletoe only encourages its growth.

In days of old the mistletoe was looked upon with awe as a mysterious and wonderful plant. The ancient Druids, we know, held it sacred and cut it down with a golden sickle with all sorts of strange, mystic rites.

The hardy Norsemen considered it sacred to Thor, because the trees on which it grew burned more brightly than others. This, of course, was because the wood of such trees was drier than usual, for a great deal of the sap had been drained away by the sinkers of the robber plant. So the trees on which mistletoe grew were called "Thor's trees," and it was a sacred law in those ancient days that if two enemies chanced to meet under a tree where the mistletoe grew, they must forthwith make friends. No one dared to quarrel under "Thor's tree."

And so as time went on it gradually became a custom with the people to hang branches of mistletoe over their doorways whenever a festival was held in the land, as a sign that all who entered must come in peace and friendship.

This is why even to-day we hang up mistletoe at Christmas time. It is a sign of friendship and good will to all. So when two people meet under its pale green leaves and white berries, they are expected to "kiss and be friends."

STORIES OF THE SEASONS

BY MARGARET CAMERON

SPRING

HOW THE SPRING CAME

One cold day, at the beginning of April, a hermit thrush was sitting on the topmost branch of an ash tree, singing a pretty song.

It was not a very fine day, for big gray clouds swept across the sky, and hid the sun.

"I cannot think why you are so happy," growled the Ash Tree to the Thrush. "Here am I, blown about by the cruel wind, till my branches and twigs feel quite dead. Will spring never come?"

"Ha! Ha!" laughed the Thrush; "spring is coming fast."

"How do you know?" asked the Ash.

"I can feel it," said the Thrush. "And the cruel wind, that you growl about, is very kind. It is making the earth soft and dry, getting it ready for the seeds to be put in."

"My seeds are all in the ground," growled the Ash Tree. "That horrid wind blew them off a long time ago."

"Well, then," said the Thrush, "it is breaking up the clods of earth, to make it easy for your seeds to push up their leaves to the light. The nut tree here is glad of the wind, too, for it shakes her catkins, and blows a cloud of yellow dust out of them, on to her tiny red flowers."

"What good does that do them?" growled the Ash Tree.

"If this dust did not blow on to them," said the Thrush, "there would be no hazel nuts later on."

That very night, when the Thrush was sleeping soundly, the cold wind stopped. Soft clouds soon hid the moon and stars. Then with a rush came the warm wind; and down came the rain. "Swish! swish!" It woke the farmer up, and he said to his wife: "Just listen to that rain! The wind has changed! Spring is here at last!"

WHERE SHALL WE LIVE?

"Tseeu-tseeer!" sang Mr. Meadowlark, as he hopped about in the hedge. "I think every bird is glad this morning because the spring has come! I am so happy that I cannot help singing all the time.

"Oh, there is Mr. Robin!" said the Meadowlark. "He is over there under the old apple tree. What a fine red waistcoat he has on! Good morning, sir. What are you doing?"

"I am looking for the best place in this tree to build our nest in," said the Robin. "Where are you going to put yours?"

"Oh," said the Meadowlark, "we have built our nest! It is down in that field near the hedge. We have five little eggs in it now. But soon they will break, and then we shall have some little baby Meadowlarks. We shall be busy then."

"Good morning!" sang a pretty brown-spotted bird as he flew up to the Meadowlark. "I am busy, too, for we are making our nest in an elderberry bush in the lane, near the farm."

"Oh, good morning, Mr. Song Sparrow! I thought it must be you," said Meadowlark, "when I heard you singing. Have you seen Mr. Flicker this morning?"

"Quit-u, quit-u! I am down here, under the hedge," said a pretty bird with a black mustache mark. "Mrs. Flicker and I have made our nest almost near the top of the apple tree this year."

"I nearly had a fight this morning," said the Song Sparrow.

"Oh, dear!" cried the other birds. "How did that come about?"

"Mr. and Mrs. Woodpecker thought we of all birds wanted their nest in the pear tree," said the Song Sparrow. "But they soon saw how foolish they were. I only flew by to see how many eggs they had. Here Mr. Woodpecker comes now across the field."

"I am not going to keep my nest in the old pear tree, after all," said the Woodpecker, as he perched on a twig beside the other birds, "for I found a lovely hole in that big cherry tree by the barn."

SUNSHINE AND RAIN

The sun was shining brightly, one morning, and the air felt warm and soft.

Under the hedges, green leaves were peeping out; for little docks, and nettles, and goose grass were pushing up their buds above the dead leaves.

Some of the buds on the hedges were fat and round, while others had burst their warm coats, and were shaking out their little green fingers in the sunshine.

All the seeds in the ground were splitting their winter coats, too, and were shouting to each other: "Do you feel the warm sunshine? Have you had a drink of lovely rain?"

"I am bursting my coat, for it is getting too small for me," cried another. "I shall soon be a little plant."

Pop! went the little seed coats, and out of each came a pair of tiny pale leaves, and a little root. Down went the root, deeper in the earth; and up grew the little leaves, till they peeped above.

The pale leaves soon turned green in the sunshine, and the little plant grew into a big one.

The trees, too, were saying to each other: "I can feel the sap running into my twigs, making my buds swell and burst."

So the brown coats fell off the trees, and the tiny crumpled buds shook out their folds, and spread into beautiful leaves.

Then came wind and clouds, and down fell the rain again, in big warm drops. These crept to the roots of the trees and little plants.

But while the rain was falling the jolly old sun peeped out from a hole in a cloud. "Aha!" he cried; "just look at the dark sky now!"

All across the sky, from side to side, there was a lovely rainbow in the form of an arch. It was like a pretty, long ribbon, with colors that faded one into the other: red, orange, yellow, green, blue, indigo, and violet.

WAKE UP, LITTLE SLEEPERS!

It was the middle of May now, and the days were growing longer and longer. The sun rose earlier every morning, and went to bed later every evening.

This made the earth and the air warm, so all the little insects began to flit about once more.

The sun knew where to look for them, for he had seen them hide last winter. So he peeped into the cracks of the tree trunks, and under the warm earth clods, to wake the tiny sleepers up.

"Come out!" he cried. "The spring is here, and you should be flying in the sunshine now." So out they crawled, one by one. The cabbage butterfly was the last to come, for she was very stiff and sleepy; but the warm sun soon made her stretch her wings. Then off she flew to the fields to lay her eggs on a cabbage leaf.

The spider had been warm and cozy, in her silk nest, behind the barn window, all the winter. But at last she woke up, saying: "I am so hungry. I must get myself some dinner!" So out she crawled into the sunshine to spin a pretty web; and soon she had caught a sleepy fly.

On the rose bush, over in the farm garden, the green fly and its young ones were all sucking the sap out of the young shoots as they grew.

"This will never do!" said the farmer's wife. "How I wish I could see some ladybeetles!" She had not long to wait, for Mrs. Ladybeetle soon flew on to the rose bush.

"Oh, cried Mrs. Ladybeetle, as she folded her soft wings under her little red jacket, "I see there is plenty of work here for me!"

So she laid her eggs, and set to work to eat up all the green flies. Soon her eggs cracked, and the hungry grubs came out of them, to help her.

Other bettles were running about on the grass, and their reddish brown backs looked very fine in the sunshine.

But up in a tree sat a Bluebird. "Aha," cried he, "I am watching where you lay your eggs, Mrs. Beetle! Then I shall know where to look for grubs very soon!"

"YOU HELP ME AND I 'LL HELP YOU!"

In the garden, up at the farmhouse, the flower beds were looking quite gay. For, all this time, pretty blossoms were opening and turning their faces to the sun.

"It is time we opened," said a Violet to a yellow Daffodil, "for all the insects are here. We need them, and they need us."

"Why do they need us?" asked the Daffodil.

"Because we give them food," said the Violet. "Down in the middle of our petals there is some honey stored for the insects to sip. Then inside our stamens is that yellow dust called pollen. The insects eat that, too."

"Well, tell us why we need them," said a yellow Dandelion.

"They throw the pollen on our seed boxes, as they fly from flower to flower," said the Violet. "We should have no seeds if the pollen were not brought to us."

"We did not grow from seeds," said a pink Hyacinth to the Daffodil. "We grew from bulbs, which the farmer planted last October."

"Ah! But we want the pollen," said the Pear Blossom. "If the insects did not come to us, we should have no nice pears when autumn came round. Ask the Cherry Blossom and the Plum Blossom, if that is not true."

THE QUEEN OF SPRING

BY LUCY FITCH PERKINS

Oh, the Queen of Spring is a dainty thing,
In her flower-bordered gown,
With her face so fair and her unbound hair,
And a blossoming wreath for a crown.

She dances along to a happy song,
By river and forest and stream;
The flowers hear her, as she comes nearer,
And rouse themselves from their dream.

Down in the meadow, beside the stream, wild flowers, just as pretty as the garden ones, were springing up.

The village children liked the wild flowers best, for they could pick them, and make them into posies.

The pretty blue Forget-me-nots, too, were in flower; but the girls had to be careful how they picked them, for they grew in moist places.

The prettiest flowers of all were the hardest to get. There were the Marsh Marigolds. They were like great yellow buttercups, with a bunch of golden stamens in the middle of each one.

They grew in a corner of the field where the ground was soft and wet. Down went your feet; and your shoes were full of mud and water in no time.

FRIENDS AND FOES

The duck-pond at the side of the road was sparkling in the sunshine; and over it, thousands of little gnats were dancing in great glee.

They flew up and down, in and out, having a fine time. Some of them were so light, that they skated on the top of the water; while others flocked together in little crowds.

They had only just left the pond where they had lived, first as tiny eggs and then as little swimming grubs. Now they had their pretty wings, and were making the best of their short lives.

Then, all at once, some great dark thing came "Swoop," right into the midlle of the happy crowd.

"Oh, dear!" cried a little Gnat. "What is it?"

"Come under this grass blade," said a big Earthworm, "and I will tell you. That is a Swallow, and it will swallow you, if you go on the pond again.

"It has just come back from a hot country, where it has been for the winter. It has flown all the way back from the south to lay its eggs here. So it is very hungry."

"Swoop!" went the Swallow again, with its great mouth wide open, and ever so many more gnats were caught on its sticky tongue.

How glad the swallows were to be back north! They flew to the farm and looked for the nest they had made last year. But it was gone. So they began to build another, against the old barn, in a cozy spot.

To and fro they flew, bringing little balls of mud in their beaks from the pond, to make the wall of their nest.

In the evening when they were quite tired, they went to rest, and left the gnats and flies in peace.

But the poor things got no peace, for, as the sun was setting, and the birds were singing before they went to bed, out came the bats.

These queer little creatures had been hanging upside down all the winter in the barns, asleep, and half-dead with the cold. But the warm night had brought them out, to look for food till daylight.

"Squeak! Squeak!" cried a Bat as he flapped his little skinny wings. "I have just caught a big fat Maybeetle! How good it tastes!" And he crunched it up with his small sharp teeth.

THE FARMER'S FRIENDS

The large field beside the farmhouse was brown and bare, and the earth clods lay in long straight rows.

One morning in spring two blackbirds were walking about among the rows, looking for grubs. One blackbird said to the other: "The farmer's man is coming to plough this field to-day, so you and I will have a fine feast."

"Oh," said the other "I thought it was ploughed last fall!"

"So it was," said number one; "but that was to turn the grass in. I remember what a big dinner we had. Now the man is coming to break up these clods and sow his seed."

Soon the farmer's man came out with his two fine strong horses. They were ready for work, and went slowly into the field, where the plough was standing.

"Back, lads!" cried the man, as he hooked the chain to their harness. Then off went the horses down the rough rows, pulling the plough along.

Its sharp knife broke up the clods, and made a neat little furrow for the man to walk in. Then down from the trees and hedges came the birds in hundreds, and gobbled up all the worms and grubs that had been turned up by the plough.

"Ha, ha!" laughed the man, as he saw the busy birds. "They soon knew what I was going to do. They are the farmer's best friends."

The cowbirds and the blackbirds were dragging the worms out of the clods, and were gobbling up the wire worms.

After the ploughing was done, a heavy harrow was dragged over the ground to break up the clods, and when all was ready, two more horses pulled a queer cart up and down the field. This had seed in it, and, as the horses walked along, the seed dropped out of some little pipes, into the furrows.

After this the seed was covered up by a harrow, so that the birds should not get it; and the ground looked smooth once more.

The farmer's men were busy every day now,

APPLE BLOSSOMS

From a photograph by Francis A. Rugg

for there were a lot of fields to plough and sow. Some fields were sown with grass seed, some with wheat seed, some with turnip seed, and some with oats, and peas.

Boys were busy planting potatoes in another field; corn and beans were planted, and the farmer and his men were putting peas, and beans, and cabbages into their own gardens.

"Let us go back to the wheat field again," said a cowbird to a blackbird.

"Oh, no!" said the blackbird. "See! There is a man there. He may have a gun and will shoot us!"

But it was only an old scare-crow after all!

WHAT THE BROOK SAW AND HEARD

"Ripple, ripple!" sang the little Brook in the woods. "How dark and cool it is in here, and how mossy my stones are! I have been running like this for so many years, that I have forgotten to count them.

"But I never saw so many frogs' eggs in the ponds and pools as there are this spring. What a good thing so many tadpoles are eaten up, or there would be far too many frogs!"

The frogs' eggs floated in the pools like glass beads; and all the time, the strange little black tadpoles were wriggling out of them, and slipping into the water.

When a tadpole first came out of the egg, it had nothing but a big head, with a sharp beak, and a long wagging tail. It swam about, nibbling the waterweeds, and grew very quickly.

"Oh, how funny you look!" cried one Tadpole to another. "You have lost your tail, and there are four little tufts growing out of your body."

"Those are my legs," said the other Tadpole proudly; "and when they have grown I shall be a frog. I shall not live much in the water then; I shall hop about in the grass, and catch——"

But the Tadpole never told what he was going to catch, for a fish darted out from under a stone and gobbled him up.

"Aha!" cried the fish. "That was a nice mouthful!" He was a very pretty little fish, all shining with green and red scales. His name was Mr. Stickle-back, and away he swam so quickly that he was soon lost to sight.

He darted along till he came out into the sunshine, under an old bridge. But here he swam very carefully, for he saw something large and dark lying in a deep pool. It was a big trout with a pretty spotted back, looking for his dinner. But just then, a boy ran over the bridge, and this gave the trout such a start, that Mr. Stickle-back got past quite safely.

On one side of the bridge, some snails had lain asleep all the winter, curled up in their shells, with their front doors shut.

But now, they were creeping slowly up a twig, with their shells on their backs.

Nearby, in the bank of the Brook, a worm was pushing its head out of a little hole. "Good morning, Mr. Worm!" said a Snail; "I don't think I would push my head out like that. There is a thrush up in the willow tree, and I think he is very hungry."

SUMMER

GROWING WEATHER

One morning very early, when the sun rose, a thick mist lay all over the ground, and hid the fields and woods from his sight.

"Oh! ho!" he cried, "summer is here already. What fine growing weather this will be for the plants and crops! I must not shine too much at first, for fear the tender things should be burned up."

Everything was covered with dew—the trees, the flowers, and the grass. The dewdrops hung on a spider's web, and made it sparkle and shine.

The sheep and the cows, too, shook off the dewdrops from their coats as they walked about. They were very early risers, for soon the day would be so hot that they could not eat.

Then they would lie down under the trees, or wade in the cool brook.

When the sun rose high in the sky, the mist faded away, and the air grew very hot.

The peas in the garden were climbing right up to the tops of their rods and peapods hung among the leaves.

"Good-by," cried one faded little Pea-flower, as she fell to the earth. "I have left a baby pod behind, to grow in my place!"

One big fat Pea-pod said, "Shine on me as much as you like, Mr. Sun. The peas in my pod are getting so big, that I shall soon be ready to pick."

The beans out in the fields had lovely white blossoms on them, and their scent was so sweet, that the butterflies lived among them. And as the blossoms faded, the fine big bean-pods grew instead.

The wheat, too, was growing up very quickly in the field, and pretty little tufts of seeds were coming on the stems. These are ears of wheat.

FIELD DAISY

WILD STRAWBERRY

SWEET WHITE CLOVER

In among them, rabbits and field mice lived.

"Do n't I look pretty?" cried a Potato Plant across the hedge to a Turnip Plant. "My leaves are growing very fast now. Under the ground, too, my dear little potatoes are coming, and will soon be large enough to dig up."

"You need not be so proud!" cried the Turnip Plant. "I have a fine white turnip under the ground. It grows larger, and more like a ball, every day."

But the grass grew quicker than anything else. In the fields where the farmer had sown grass seed, fleabanes and grasses were coming up. The grass was so tall, that when a dog ran into it after a rabbit, no one could see him.

HAY TIME

"The weather is so hot and fine," said the farmer, "that I think we can cut the grass to-morrow in the field beside the mill stream."

Off went one of the men to the cart shed to look at the mower, which had been lying there since last year.

The man made the knives very sharp, so that they would cut well; and he oiled the wheels and chains, so that they would turn easily.

Then he took a very long curved knife, called a scythe, and went down to the field. First he began to cut the grass round the fence, so as to make room for the horses to go round.

As he cut, the long knife went "Swish, swish," at the roots of the grass, and down it fell quite flat on the ground. Soon there was a broad track all round the field.

Next morning, very early, a Lark that was sitting in the grass with her young ones heard a strange noise.

"What can it be?" said she. So Mr. Lark flew up into the sky to see. He saw the horses pulling the mower into the field.

"We must get away as quickly as we can," he said. "What a good thing our little ones can fly!" So they all flew over the fence.

On one side of the mower some knives stood out beside the wheel. When the wheels turned, these sharp knives moved to and fro, cutting the grass.

A man sat on the mower, and drove the horses with one hand, while he held a handle with the other.

"Click, click, click," went the mower, as the horses began to move, and in among the grass the little knives worked. Then down fell the grass in long neat rows, as the mower went round and round the field.

At last there was only a little grass standing in the middle; so, as it was dinner-time, the man stopped mowing.

The horses got some of the sweet grass for their dinners, and then went down to the mill stream for a drink.

The man was very hot, for the sun was shining fiercely. So he sat down in the shade to eat the dinner which the farmer's wife had sent.

There was something nice to eat in a basket, and something cool to drink in a big stone jar.

After dinner, the rest of the field was cut; but before he did it, the man turned a good many mice and birds out of the grass.

WITH FORKS AND RAKES THEY PULLED THE HAY INTO BIG HEAPS

MEADOW BUTTERCUP

LOW HOP CLOVER

The day after the grass was cut it was tossed about with a fork to let the sun and wind make it into hay and the children went to the sweet smelling field to play.

What a jolly time the little ones had! They played hide-and-seek in the hay; they tossed it about; then they made a bed of it, and went to sleep for the rest of the morning.

Then the big boys and girls came to the hay-field for dinner. Mother laid a white cloth on the grass, and put plates all round. There was a big pie, and it tasted very good.

The farmer kept looking at the sky, for some big clouds were peeping over the poplar trees. "It will be a pity if we have rain to-night," said one of the men, "for the hay is drying fast."

It was still very hot, even though the sun was setting, and the folks were all tired out. All at once there was a noise like a dog growling. It came from the dark clouds.

"Hullo!" cried the farmer. "A thunderstorm! We must get the hay into stacks before the rain comes."

They all rushed into the field at once, with forks and rakes, and pulled the hay into big heaps.

It was all done so quickly, that the people had reached home before the rain came on. How the thunder growled, and how bright the lightning was! But the storm did not last long, and soon the moon came out.

Next day there was a nice cool breeze, and so the hay was spread out once more. The sun and wind soon made it quite dry. Then the wagons were filled with hay, and every load was taken to the barn.

One man stood in his wagon and threw the hay with a fork to the man in the mow. Then other men came with their loads, till the hay was all in and the mow was filled.

The boys and girls had fine times riding on the loads of hay. It was such fun, too, to run up the ladder on to the top of the mow, and slide down again.

FLOWERS TO PICK, AND FLOWERS TO LEAVE ALONE

The farmer's wife came out into the garden, one sunny morning, to look at her flowers. "Oh, how pretty they all are!" she cried. So she got a pair of scissors and went down the garden path.

The purple and white flowers had nearly all dropped from the lilac trees, and the white snow-ball blossoms were fading now. Bright celandines held up their yellow cups; but they did not please the lady. "You do not last long in water," she said.

"Oh, the roses look lovely this morning!" she said. "I will pick some of them." Crimson roses were climbing over the porch, and lovely yellow ones were growing up the wall.

Then the lady picked some pinks that were growing at her feet. With them she put some pretty sweet peas and some large white daisies.

Her bunch was quite big now, but still she wanted more flowers; so she picked some sweet-scented petunias.

"See the clover over there," she exclaimed. She added some to her bunch.

"The bees love you," she said, "better than all the other flowers in the garden."

"Do n't forget us," said a little purple flower growing by the path. It had a queer little face, and looked as if it were made of purple velvet.

"Oh, no, Pansy," said the lady, "I will not forget you! But you know, you fade very soon."

"Why do n't you pick some of these pretty white flowers, Mother?" cried little Dora from under the fruit trees.

"If I picked those flowers you would have no nice raspberries," said her mother. "Very soon they will grow where these white flowers are now, and then you can have some. For you like raspberries, do n't you?"

"Yes, Mother," said Dora. "Do n't pick any of these flowers, then."

"I will show you some more flowers that must not be picked," said her mother.

"Those little green flowers, hanging from the currant bushes, will turn into nice currants soon."

"Here are some more on this bush," said the little girl. "Oh! but there are some nasty sharp thorns on the stems."

"That is a gooseberry bush," said her mother. "But its little green flowers have turned into fruit now."

"May I have that little gooseberry?" asked Dora.

"No, dear," said her mother; "you would not like it. It is sour, for it is not ripe yet."

TIT FOR TAT

The trout in the mill stream were having a fine time; for the pretty little may-flies had come out at last, and were dancing over the water in the sunshine.

One of them was just floating on the stream, when "Snap!" and there was no fly left; for a greedy fish had come to the top of the water and gobbled it up.

"It is too bad," said a May-fly; "those horrid fish will not leave us alone! We only have one day to live, so they might let us enjoy ourselves."

FLOWERS TO PICK

"I think these dragon-flies are just as cruel," said another May-fly. "Just look at that green one!"

The dragon-fly was a lovely insect, for his body was sparkling with green and gold. His wings were just like thin lace, and he had two great yellow eyes sticking out of his head. He darted to and fro, as fierce as a tiger, snapping up gnats or flies, and eating them while he flew.

He himself had once been an egg, and a grub in the stream. Even when he was a grub he was fierce, for then he had two cruel jaws. He hid these under his head, and then shot them out all at once when he came near another grub.

From the trees long thin threads were hanging. On the ends of these threads, queer little caterpillars dangled down almost in to the water.

For a butterfly had laid her eggs on a branch, and out of them had come these little caterpillars. They were now trying to get out of the way of the hungry birds, and so got into the way of the fish and dragon-flies. For they were being eaten up in hundreds.

But the fish and the dragon-fly did not see a bird watching them, from a branch near the water. It was Mr. Kingfisher, who had just come out of his nest in a bank nearby. Even though he was a bird, he lived in a burrow like a rabbit. Mrs. Kingfisher laid her white eggs at the end of it, in a bed made of fish bones.

The Kingfisher was a beautiful bird, with a long beak and a bluish-gray head. His breast and body were white and there was a blue band across his chest. He also had bluish-gray wings and back, and a striped tail. His picture is on page 28 of this volume.

A fish darted up above the water to gobble a caterpillar, and in a flash the Kingfisher had the fish in his mouth.

Then he flew home with it for his little ones and came back again to catch another.

THE RAINDROPS' WASHING DAY

The raindrops were falling gently, one afternoon in July, from a little cloud that had floated across the sky.

One drop fell right into the middle of a sweet wild rose, and lay there like a diamond.

"Your pretty pink face does not need a wash," said the raindrop to it; "but I never feel summer is here till I see you in the fence."

Another rose was by its side, and some buds as well. Two buds were tiny and red, but another held up its head like a little pink cup.

"Oh, dear, dear," cried the rain to the trees, "it is time I came! What dirty faces you all have; and I never saw such dusty leaves! These by the fence at the roadside are quite white."

"Oh, do come quickly and wash us," cried the poor trees, "or we shall die! The dust from the motor cars on the road has nearly choked us. We cannot breathe."

For you know the leaves have tiny holes in them, through which they breathe. So the rain came faster and faster, till it had washed the leaves and made them happy again.

Some sweet-scented Honeysuckle, that had climbed to the top of the fence, said to a Butterfly, "You would like to know what is inside my red buds, I am sure." So she burst them open, and hung her long stamens out.

"Put your tongue down my yellow throat," said she "and taste the sweet honey which is at the bottom."

On the other side of the fence, an elder tree was opening her white waxy blossoms. They were very tiny, to be sure, but there were so many on a stalk, that they looked like a big bouquet.

The bees loved the elder flowers, and so did the pretty butterflies.

Little Speed-wells opened their cups wide for the cool rain, and said, "We knew you were coming, for the scarlet pimpernel shut up his red face an hour ago."

"Aha!" said the raindrop! "he does not like to get it wet, I know."

AT THE SEASIDE

The farmer's two children, Fred and Dora, were at the seaside. Their aunt had asked them to come and spend the August holiday with their cousin Kate.

The children went down to the shore every day. So many strange things were there, that they never wanted to go anywhere else.

Cousin Kate had lived by the sea all her life, and so she knew as much about the shore as Fred and Dora knew about the country.

What Dora liked best was to look into the pools that lay among the rocks, and watch the little creatures which lived in them.

There was one pretty pool quite close to the sands, which the sea filled with water every day. It looked just like a garden, and had a lot of pretty shells in it.

Kate told Dora that these shells were the homes of little shellfish. "Some of them only want one shell to live in," she said; "others have two."

"Look at these winkles!" said Fred. "They have only one shell, like snails."

THE SUMMER QUEEN

By Lucy Fitch Perkins

THE Summer Queen is sweet and serene,
Beloved the whole world over.
The meadow grasses wherever she passes
Are spangled with daisies and clover.

The blue of the skies shines again in her eyes,
Her hair is like golden grain.
The jewels drip down on her rose-leaf gown
Like the dew and the summer rain.

"They are sea snails," said Kate. "They push out their horns, and walk along with their shells on their backs, too."

"These are mussels," said Dora. "I know them, because you once sent us some. When we steamed them the shells opened, and we saw the fish inside."

"When they are alive," said Kate, "they can open and shut their shells when they like."

"What is all this red and green stuff on the rocks?" asked Fred.

"That is seaweed," said Kate. "It is a plant which grows in the sea. It holds on to the rocks with some little fingers. It has no roots.

"Hundreds of little fish live among the seaweed," said she "and they feed on it as it floats in the water. There goes a little shrimp, darting through the water!"

"It looks as if it were made of glass!" said Fred.

On the rocks were some white shells, which looked like fairy tents. "Those are the limpets," said Kate. "They cling to the rocks. Sometimes, if you are quick, you can pick one off."

But Fred was not sharp enough, for the limpet pulled its shell down tight on to the rocks, and nothing could move it.

"There are two shellfish you have not seen yet," said Kate. "Just look for them." Fred looked into all the little holes in the pool, and at last he found a little green crab hiding under some seaweed.

It was lying in a hole, with its two round eyes staring at Fred, and its two big claws ready to nip him.

It had four queer crooked legs on each side of its body, and when Fred gave it a push it crawled off sideways into another hole.

"Is this the other shellfish?" asked Dora. "It looks like a red star."

"It is a starfish," said Kate, "and if you look under one of its points you will see some tiny white threads. Those are its feet."

"Oh," said Fred, "look at those lovely flowers in the pool! They are opening in the sun."

"They look like flowers," said Kate, "but they are animals.

"Those threads which you think are petals are really arms, with which the little creatures get their food. They are sea anemones; so they have names like flowers, too.

"If you touch them," said Kate, "they will shut up like flowers."

"Look at this lump of jelly!" said Fred. "What can it be?"

"It is a jellyfish, and it swims about in the sea. Some day, when we go out in our boat, you will see them, in deep water, floating along like fairies' umbrellas."

"Oh, look at the seagulls!" said Dora. "Don't they seem happy? Why do they fly so near to the waves?"

"They are looking for their dinners," said Kate. "They eat fish of any kind."

"What strong wings they must have!" said Fred. "I can see one right out over the sea."

"They can swim, too," said Kate, "for they have webs on their toes, like all the water birds. If they see a fish in the water when they are away up in the sky, they can drop down at once. The fish tries to get away, but the seagull catches it."

Kate took her cousins one day to have a bath in the sea. It was a fine hot day, but the sea felt very cold when Dora put her foot into the water. When she saw Kate run in, she ran in, too.

Both Kate and Fred could swim, so they began to teach Dora. Poor Dora got her mouth full of water, and it was so salt. "It does not taste fresh, like the water in our stream at home," she said.

But Dora could soon swim, and by the end of the week they were all having races.

AUTUMN

THE NOISE IN THE WHEATFIELD

The wheat in the field beside the farm was quite yellow and ripe now, for harvest had come. The ears of wheat were full of seeds, and the stalks were stiff and yellow.

The tiny harvest mice had made a sweet little nest among the wheat stalks. It was about as big as a large apple, and was neatly made of grass.

It had no doors, but Mrs. Mouse just pushed her nose in and got in through the hole.

Her mice were quite big now, so she said to them, "Autumn has come, and the wheat is quite ripe. Soon the men will come to cut it with that noisy thing they call a reaper. You must take care of yourselves, now, for Mr. Mouse and I shall have to run away when the men come."

Sure enough, next day there was a "Whir-r-r-r," and round and round the field went the horses, pulling the reaper.

This reaper was a strange-looking thing, with

COMMON DANDELION

DANDELION SEEDING

CANADA GOLDENROD

sharp knives to cut the wheat stalks, and with some big arms, that went round and round, to catch the wheat as it fell.

The reaper tied the wheat up into sheaves, and threw them down on the ground as it went along. Then some men picked these sheaves up, and stood them against each other.

Very soon the sun and wind dried them as they stood, and then they were put into carts and taken to the farmyard.

The men had to work hard, after the sun had set, in case rain should come on. But just as the sky was getting dark, the big full moon rose above the tree tops, and made it as light as day.

"Ah!" said the farmer, "here is the harvest moon. Now we shall get our work done to-night."

In the farmyard some men were making the sheaves into a round grain-rick. This rick stood on four tall stones, so as to lift it off the ground, and keep the rats and mice from getting the wheat.

All the ears of wheat were put into the middle of the rick, so that the birds and the rain could not touch them. When all the sheaves had been put on the rick, a man took some wheat stalks and made a straw roof for it.

THIEVES IN THE ORCHARD

"I am so glad that autumn has come," said a Blackbird to a Thrush one sunny morning. "We never get such feasts at any other time. Just look at those berries on the elder tree! I have had such a breakfast of them that I can hardly sing."

Where the tiny elder blossoms had been in summer, the purple berries now hung in great bunches. They were very tiny fruits; but they were so sweet that the birds loved them.

"No one need be hungry now!" said the Thrush. "I have just eaten a lot of sweet bramble berries off the hedge. The boys and girls came to pick some just as I had done; but, ha! ha! I had the ripest berries before the lazy things were out of bed!"

"Why do n't you wipe your beak?" said the Thrush to a Mourning Dove.

"I have been eating some rose-apples," said the big bird; "but the seeds are so sticky that I can't get rid of them."

"You should leave the apples on the rose bush," said the Thrush. "They are winter food, and should be kept."

"Well, good-by," said the Blackbird. "I am off to the orchard to see if the apples and pears are ripe."

In the orchard there was a chatter in the trees, for birds of all sorts and sizes were pecking at the ripe fruit.

The apples were quite red and rosy now, the pears were turning yellow, and the juicy plums were red and purple and gold.

But the wasps and hornets had found the best plums, and were eating holes in their sides. The Blackbird, too, pecked at a ripe pear, and ate the juicy fruit.

But just then a farm boy came out, and made the birds all fly away. "They are eating all the damsons," said the boy, as he looked up at the dark purple fruit.

"Shoo! Shoo!" he cried, and waved his arm.

"I do n't see why folks should be so greedy," grumbled the Thrush. "We eat up all the slugs and snails that kill their plants, and then they grudge us a taste of their fruit!"

But the birds' feast did not last long. For ladders were put up against the trees, all the fruit was picked by men and girls, and was taken away in baskets to be sold.

GETTING TIRED

The sun went to bed much sooner now than he did in summer. And he was getting lazy in the morning, too, for he did not get up quite so early.

When he did rise, he peeped out at the fields from behind a cloud, and said, "Yes; autumn is here, sure enough! It feels cool this morning, and that mist over the stream shows how chilly it has been all night."

The dew lay thick and cold on the flowers, too, and did not dry up quickly now. Behind the wood-stack, where the sun did not shine, the ground never got dry at all.

But in the middle of the day it was as hot as summer time, and the bees and butterflies flew about as gayly as ever.

In the garden a lot of day lilies and hydrangeas were hanging their heads as if they were tired, and wanted to go to sleep. But the fine blue gentian opened her flowers, and the golden-rod and live-forever still made the garden gay.

"Oh!" said the farmer, "it is a sure sign that autumn is here, when the golden-rod and gentian flower."

Some of the bees and butterflies had laid their eggs in a safe place, and were dead; while others were getting ready for sleep.

The bees were working hard, to gather as much honey as they could before all the flowers faded. "The honeycomb in the hive must be full of

THE QUEEN OF THE FALL

BY LUCY FITCH PERKINS

THE Queen of the Fall is mother of all,
Her face is kind and sweet,
The clustering vines her bowers entwine,
Her crown is a garland of wheat.

She brings in her train the ripening grain,
And orchards with fruit aglow,
The cellars and barns, on all the farms,
With plenty overflow.

honey," they said, "so as to last us all the long winter."

But as the bees always made a lot more than they needed, the farmer was able to have some honey, too.

In front of the farmhouse a boy was busy sweeping up the dead leaves and burning them in a heap.

For where the old leaves were growing on the branches, next year's leaves were coming, and sucking up all the sap.

So the old leaves began to turn brown, yellow, or red, and fell one by one to the ground.

The young birds were able to fly as well as their mothers now, and were busy stealing wheat from the farmyard.

The cuckoos and bobolinks had flown away; for there was not much to eat now, as the insects were hiding themselves away.

So these birds flew south to warm lands where it was always summer, and where there was plenty to eat.

AFTER THE SWALLOWS WENT

It was a wild windy day, and the trees round the farmhouse were waving to and fro. Black clouds flew over a gray sky, and everything looked cold and sad.

When the wind blew, it sent the leaves flying across the fields, and the trees began to look very bare. The fields, too, were bare, for even the potatoes and turnips and cabbages had been gathered up and packed into the root celler for winter food.

It began to rain, too, and the drops splashed on the kitchen window of the farmhouse. "We shall have to light a fire to-night," said the farmer, "if it is so wet."

The ran splashed on the mud walls of the swallows' nests under the eaves; but there were nc swallows there. For they had all met, one fine still day, and flown away with their young ones, till spring should come again.

The garden flowers were nearly all gone, and their leaves were lying on the wet ground. The live-forever had faded, and the gentian plants were bare.

But next day the sun shone out, and the sky looked blue once more, to show that autumn was not quite gone yet.

Then the few insects that were left came flying to the white aster near the wall, to sip the very last honey from the very last flowers.

Wasps and flies, and even a pretty brown butterfly, pushed each other to get a sip, and sat on the blossoms, shaking their wings in the sunshine.

"It is a good thing there are a few insects left, Fred," said the farmer to his son.

"Why, Father?" asked Fred.

"These flowers want pollen on their seed boxes, to turn them into fruit, just as much as the flowers of spring and summer did," said he.

The rain had made the dusty road very muddy, and great pools of water lay in the path leading up to the farm.

Next morning, when the farmer looked out of his window, there was a white frost over everything. "Ah," said he, "winter is coming now very fast!"

WINTER

A FOGGY DAY

It was a very foggy day, and it was very dark, too; for, though the sun was shining, he could not send his beams through the thick fog.

But in the afternoon a little wind blew, and the sun was able to peep out of the fog.

"Look at the sun!" cried a boy. "It looks like a red lollipop!"

The sun sank lower in the sky, till it hid behind a bank of clouds. Then the day grew dark, though the clock had only just struck "Three." By five o'clock it was dark enough to make one believe it was night.

How still everything was! Not a bird was stirring, and all the farm animals were safe and warm in their comfortable barn.

Most of the folks had lighted their fires, and all the children sat around them, warm and cozy.

One mother went to the window and looked out. "The fog has gone!" she cried. "The wind has blown it all away. I can see the moon and stars."

"Ah," said the father, "they shine very brightly to-night! That means that Jack Frost has come back again."

JACK FROST

Yes, Jack Frost had come back again, and was hiding outside in the woodbine leaves.

"Who is he?" you ask. Well, no one has ever seen him or heard him, but everybody has seen his work.

He began to work hard, too, that night, laying his cold fingers on the leaves that were left.

THE WINTER QUEEN

BY LUCY FITCH PERKINS

Oh, have you seen the Winter Queen,
In her robe of filmy lace,
With her shining crown and her cloak of down,
And her gentle, dreaming face?

The flowers love her, for a snow-white cover
To keep them warm she brings;
She tucks them round with a crooning sound,
And they fall asleep as she sings.

He touched the beech leaves, and they fell, all red and brown. The oak leaves turned yellow as they fell. The elm leaves dropped on to the grass, and the dead ones under the trees turned crisp and dry.

But the evergreens did not seem afraid of the frost, for there were still green leaves left on many of the trees and bushes.

"Ha! Ha!" said the pine tree. "You can run your cold fingers all along my needles and cones, but you cannot do them any harm."

And the holly tree said, "My prickly leaves are too thick and glossy for you to hurt."

Then the bayberry cried out, "Come, little birds, creep in among my leaves and be cozy. Jack Frost will not hurt me." But, all the same, some of the birds were afraid of the frost, and flew away to warmer lands.

Then Jack tried to make the earth afraid; but she said, "No, Jack, I am still warm, right down to my heart, for the kind sun has been shining on me all the year. You cannot touch the things which I am keeping safe."

"Aha!" he cried; "your friend the sun is lazy now, and he gets up later every morning. You will not get much more heat, and then I shall freeze you hard."

So Jack puffed his cheeks out, and blew a big breath. It made the air grow clear and frosty, and then the stars and moon shone brightly.

Next morning Jack was still about; for as the children went to school, he rushed at them and nipped their noses and ears till they were red. Then he bit their fingers and turned them blue with cold.

But when the sun shone, Jack slunk off, for he was very much afraid of the sunbeams. He did no more work till the sun went down.

One night, in December, while Jack was working hard, the north wind began to blow, and great clouds came up in the sky.

But they were not the black clouds that bring the rain; they were big white clouds that look like soft wool.

Soon the sky was covered with them; then down came something soft and white, like feathers floating in the air. They were the snowflakes.

The north wind had made the rain clouds into snow clouds, for he had frozen the little raindrops into crystals.

The crystals were so tiny, that they stuck to each other and made snowflakes. Then, when the flakes were too heavy, they floated down to the earth.

Down came the snow, so softly that it did not wake anybody up, and covered everything with a thick white blanket.

And in the morning, when folks looked out of their bedroom windows, they saw a pretty sight.

Snow lay on the roofs of the cottages and made them look like sugar houses. It lay thick, too, on the trees and bushes, and covered everything with soft white feathers.

The fields were like white carpets, and the roads were just white paths between the hedges.

One by one the cottage chimneys began to smoke, and a sweet smell came from the burning wood. Then out into the road ran the boys and girls, racing and laughing, for they were all glad the snow had come.

JACK FROST AT HIS TRICKS AGAIN

Jack Frost had a fight with the sun one day. If the sun had been strong, Jack would not have had the fight with him; but the sun was lazy and weak, now that winter had come.

The sun had tried hard to melt the snow with his poor weak sunbeams. But Jack had blown with his cold breath, till the snow crunched as you walked on it.

Jack was turning the water of the pond into ice, and the sun was trying to keep him from doing so.

But Jack won, as the sun went down and soon the pond had a thin cover of ice all over it. Then the ice grew so thick, that the boys could slide on it.

But it was hard to freeze the stream, for its water was running fast. But after a little time, the ice on the banks pushed out long spikes, and took hold of other spikes, till all the stream was covered with ice.

Then the fish took a long nap in the water under the ice, and the frogs crept down close in their beds.

When Jack had done all this, he crept to the houses and blew on the window panes.

As he blew, pretty ice pictures came on the panes, and covered them so quickly that no one could see through the glass.

Queer trees, ferns, and flowers grew in the pictures, all white and sparkling, like fairy plants.

Then Jack crept into the kitchen and blew into the fire. "Oh," said the children round the fire, "see how red the coals burn to-night! Jack Frost must be about."

When they said that, off he crept again, and found a jug of water in the pantry. He put his hand into the water, and the jug gave a loud crack!

A girl came running to see what the noise was. "Oh, dear!" she cried; "this water is frozen, and has cracked the jug!"

"Ha! ha! ha!" laughed Jack, as he crept off.

The boys and girls had made their skates very bright and sharp. "The ice is thick on the ponds to-day," said a boy; "let us go for a skate." So he and another boy went to the pond.

There was one poor man on the ice, who could not skate very well. He was always falling on his back, and looked so funny with his legs in the air!

WHICH OF THEM WON?

One day the sun shone right into Mr. Squirrel's nest and woke him up from sleep.

"It almost feels as if spring were coming," said he. "I think I 'll have a nut or two." But as he went along he saw some snow behind a tree.

"No," he said; "it is not time to wake up yet. It is still winter." So he ran back to his bed again.

The trees in the wood were very bare and brown, but here and there was a holly tree with bright red berries among its glossy leaves.

This was where the birds came when the north wind blew cold, and when they all were hungry.

For they had eaten most of the rose apples off the bushes, and had picked up all the seeds they could find.

The willow tree was the first to break its buds, and very soon one tree hung out some pretty yellowish catkins, that looked like pussy tails.

On another tree were hanging the downy seed catkins.

Then, after a time, when the snow melted, sweet little snowdrops pushed green stalks up, and hung out their little white bells.

The sun and Jack Frost still had many a fight, and sometimes the sun won. That was when the south wind helped him.

But very often the north wind blew, and Jack was able to stop the stream and give the boys some more skating. Then the snow fell, and it was winter again.

But one day the snow melted quickly, and all the roads were muddy and wet. The stream was full of water, and the birds began to chirp in the bare trees.

Then, out in the gardens, little yellow and purple flowers came here and there, as every little crocus pushed itself above the ground.

The big black crows met in the tall elm trees every day, and made a dreadful noise.

"It is almost time I began my song again," said the Thrush, "to let every one know that spring is not far off."

So he began his lovely song. Then all the world knew that winter was gone, and that gladsome spring was coming once again.

"NOW, MR. PAINTER, I WANT YOU TO GIVE ME A VERY DETERMINED EXPRESSION. BUT PLEASE DON'T MAKE MY BILL LOOK TOO LARGE."

AMERICAN ELM

LEARNING TO LOOK ABOUT YOU

EDITED BY W. S. CAMERON

LESSON I—JACK FROST

It was winter time. The hills far away were covered with snow. The lawn and the trees were white, and everything sparkled with frost.

"I wish the spring would come, Uncle George," said Dolly. "Then we could go out for walks."

"Can't we go out for walks in winter also, Dolly?"

"Yes, but we do not see much outside in winter—nothing but bare trees and snow," cried Dolly.

"That is because you do not look about you," said Uncle George. "Come, let us go to meet the boys. I think you will find some things outside to look at and think about, even though it is winter."

Dolly clapped her hands with joy, and soon she and her uncle were walking along the road.

"How quiet everything is," said Dolly. "The birds do not sing in the wood, and even the brook is still."

"Most of our birds fly to warmer lands before winter comes on," said Uncle George. "The birds that stay with us in winter are too busy looking for food to have time for singing. You could not sing yourself, Dolly, if you were cold and hungry. The brook we cannot hear, because it is covered with ice."

"Where are all the flies and bees, Uncle George?"

"The bees are snug in their warm hive. They gathered enough honey in the summer to keep them in food all the winter.

"Flies, wild bees, and wasps are asleep. They will wake up when the flowers and the warm weather come.

"Even the plants are at rest under the ground. When the frost and snow go away they will all spring into life. Winter is the season of rest and sleep."

"The trees and the hedges look very pretty in winter," said Dolly. "They put me in mind of the picture of Fairyland in my new story-book."

"Yes, Dolly, it looks as if the fairies had been busy covering every little twig with gems."

Uncle George took up a small piece of wood and showed Dolly that it was covered all over with little stars and bars of ice.

Just then they got to the pond. Here they found Frank and Tom having a merry time. The pond was frozen over, and the two boys had made a big slide right across it. With what shouts of joy they slid over the ice. Dolly was glad to join them in their play.

QUESTIONS AND EXERCISES

1. Why is winter called the season of rest?
2. Where are many of our wild birds now?
3. Describe the woods, or the brook, in winter.
4. What makes the pretty gems on all the trees?

LESSON II—HOLLY AND FIR

"Do you think winter a dull time, boys?" Uncle George asked this as he and Dolly and the two boys were coming home from the pond.

"No, winter is a jolly time," said Frank.

"We have no bird music and no flowers in winter," said Dolly.

"But we have slides and snowballs," said Tom.

"And warm fires, and Christmas, and lots of other good things," added Frank.

"The trees are bare," said Dolly.

"Not all the trees, Dolly. Look at this one." Uncle George pointed to a tree as he spoke. It was covered with bright green leaves. "Do you know the name of this tree?" he asked.

"Yes, it is the holly-tree," said Frank.

"That is right; but how do you know?"

"Because it has prickly leaves," said Frank.

"Because it has red berries," said Dolly.

"Because it keeps its leaves on in winter," said Tom.

"You are all right," said Uncle George. "But Frank's answer is the best. The holly is one of the trees we have with cruel spines on its leaves. We can tell most trees by the shape of their leaves. Look at the leaves near the top of the holly-tree. I will reach one down for you. There are no prickles on it; yet you could tell it was a holly-leaf by its shape.

"We must take a few of these leaves home and draw them.

"Red berries grow upon the holly-tree. But they are also found on a few other trees and bushes.

"Tom said 'Because it keeps its leaves on in winter.' Now we have other trees that keep their leaves on all through winter.

"Look at this one. It has its leaves on still. It is the fir-tree. How can you tell a holly-tree from a fir-tree, Tom?"

"The leaves of the holly are broad and flat. They have sharp corners. The leaves of the fir are long and round. They are shaped like large needles."

"That is quite right," said his uncle, "but we can also tell many trees by the shape and size of the whole tree.

"Now, Frank, it is your turn. Tell me all you can about the shape and size of the holly-tree and of the fir-tree."

"The holly-tree is not so tall as the fir-tree. It is rounder, too, in shape. Its branches and leaves grow very close together. The fir-tree seems to grow anyhow. It sends out great clumsy branches high up, and far apart."

"Good, now look at these two trees more closely. Come over here and feel the bark of the fir-tree. It is very rough. The bark of the holly is smooth. The leaves of this holly-tree are bright green. There are many kinds of holly-trees. Some have leaves edged with yellow. Some have leaves without any prickles."

"Do the leaves never fall off the holly and fir?" Frank asked.

"Oh, yes, but they do not fall off all at once like those of most trees. If you look under the holly-tree, you will find many fallen leaves. These leaves fall off, one by one, all the year round. But new leaves come as old ones fall off. That is why the holly and fir are always green. Such trees are called 'evergreen' trees."

"Why are all the prickly leaves low down?" asked Tom.

"Can't you guess, Tom?"

"I know," said Frank, "it is to keep cows from eating them."

"Quite right," said Uncle George. "Up above, where the young branches and tender leaves grow, there are no prickles. These are out of the cow's reach.

"But now we must go home to supper."

QUESTIONS AND EXERCISES

1. Only the lower leaves of the holly are prickly. What is the reason for this?
2. Draw the holly-leaf from a real specimen. Compare it with the leaf of the fir.
3. What are evergreen plants and trees? Name some you happen to know.
4. What is the color of the holly berries?

LESSON III—THE CROW

"The crows have come back, Uncle George," said Tom. "We saw them at their old nests in the trees."

"Yes," said Uncle George, "I saw them in a ploughed field to-day."

"What do they do in a ploughed field?" Tom asked.

"Oh, I know that," said Frank. "They find something to eat in the earth that the plough has just turned over. You can see them picking things out of the soil."

"I am glad you use your eyes so well, Frank," said Uncle George. "Many people would pass the birds without seeing what they were doing. At this time of the year crows help the farmer very much. They eat up great numbers of grubs."

"What are grubs, Uncle George?"

"Grubs are creatures like worms. They live in the soil, and feed on the roots of plants. These grubs do much harm to the farmer's crops.

"Let us go to the place where the crows build their nests, and watch them closely."

Uncle George and the two boys could hear the crows long before they came near their nests.

"Look!" said Frank, "There they are!"

Uncle George looked and saw a great number of them feeding in the newly ploughed field. When Uncle George and the boys came near the field they flew off. Some crows were perched here and there round the field keeping watch. They let the others know when danger was near.

"Why does the farmer shoot the crows?" Tom asked.

"Because they steal from his fields and gardens."

"They never steal from our garden," said Frank.

"Because our garden is near their nests. The crow is a sly bird. He never steals near his home. If he did, his nest would soon be pulled down. He robs fields which are far away. The crow is a walking bird. He does not hop like most of our wild birds."

The boys could see the crows carrying little sticks in their big strong bills.

"A crow's nest is a very clumsy one," Uncle George went on. "It is built of small twigs, and it is nearly quite flat."

"Yes, I know," said Frank. "We saw a crow's nest last year when one of the trees was blown down. We saw four eggs. They were pale bluish-green eggs with blotches of brown and olive-gray."

"One fine lesson the crows teach us," said Uncle George, "is to be kind to each other.

"The crow is very kind to his mate. He brings her food while she sits on her eggs. At night, he sleeps close beside the nest, and watches over his young ones with great love and care."

QUESTIONS

1. Where do crows build their nests?
2. Why do crows go far away from their nests for food?
3. How do crows injure the farmer?
4. What good do crows do the farmer?
5. What color are crow's eggs?
6. Where does father crow sleep?

LESSON IV—THE WOODS IN SPRING

The next time Dolly and her uncle went for a walk, everything was changed. The fields were green. The trees were no longer bare. Most of them were covered with new green leaves. The cold days of lingering winter were past.

The sun was shining brightly. Its warm beams were waking up the plants from their winter sleep. Little lambs were skipping about in the fields, and daisies were peeping up from among the grass.

"Let us go to the woods," said Uncle George, "and see if the flowers and the bees are awake."

In the woods there was much to see and hear. The pretty wild flowers were opening to the sun. The air was full of bird-music.

Little Dolly could scarcely help feeling that she was a bird herself.

She gathered blue-eyed grass at the edge of the noisy little brook. She could not help singing all the time—she was so happy.

Everything was bright and gay. Even the brook seemed to be singing with her.

"How is it that every living thing is so happy in springtime, Uncle George?"

"How is it that my little girl herself is so happy?" asked Uncle George.

"I suppose it is because all things around us seem so bright," said Dolly.

"Yes, that must be the reason. Spring is the glad time of the year. It is also the busy time. After the long winter rest, plants and insects and birds are full of life and strength.

"Look at the birds, how they hurry about among the trees. They are busy building their nests. How happy they are! They only stop work to sing to each other.

"The bees fly from flower to flower gathering honey. Over the water of the brook you can see crowds of tiny flies. They have just come out of the water."

"Out of the water, Uncle George? How strange!" said Dolly.

"Yes, these flies have slept all through the winter at the bottom of the brook.

"In autumn they were little water-grubs. These little grubs went to sleep. During their winter sleep they changed into flies. Each fly was inside a little case. Now they are bursting those cases and coming out into the air to fly about."

"What a lot of pretty flowers there are," said Dolly. "Here are buttercups and violets and spring beauties all growing together."

"The flowers have awakened, too," said Uncle George. "On the trees the buds have burst and the young leaves have come out. Leaves are very pretty when they first come out of the bud. They are small and of a pale green color. That is why the trees are so lovely in springtime. Leaves grow bigger and darker in color as they grow older."

"There must be a great many birds in the woods," said Dolly.

"In spring," said Uncle George, "many birds come to northern lands from warmer parts. They fly many hundreds of miles. They leave cold climes every year before winter comes on, because they cannot get food there in winter.

"But they come back again in spring, and build their nests and rear their little ones. They sing to people all summer, and leave again in autumn."

QUESTIONS AND EXERCISES

1. Where are the flies in winter-time?
2. Tell something you have noticed about the woods and fields in spring.
3. Name some spring flowers.

LESSON V—THE FIELDS IN SPRING

Dolly and her uncle walked along the borders of the farmer's fields. It was the month of April, and they wanted to see what the fields were like at this time of the year.

"How changed everything is," said Dolly. "The snow has gone. The bushes are putting forth their leaves. The birds are singing everywhere. And look, here is a pretty flower."

Dolly stooped to pick up a pretty white flower. "See, Uncle George, here is a flower without any leaves. I always thought every flower must have leaves on the stem."

"You are quite right in thinking so, and this is no exception, but the leaves have not come up yet. They will appear later. That is the hepatica, and is one of the first flowers to hail the spring."

"O, here is another!" cried Frank, "but it looks somewhat larger. See how pure white it is. What is that little bunch on the stem?"

"That is the bloodroot, and what you call a little bunch is the leaf coiled up. As soon as the leaf unfolds, the flower falls. You are very fortunate in finding it out, as it stays in bloom only a few days.

"See over on the rocks, those beautiful red bells. How gracefully they swing when the wind blows. Now look, and you will see that they have yellow centers. It is the flower of the wild columbine, and does not seem to be afraid of the sharp winds, for it has strong roots, and knows it is safe. This beautiful plant ought to be cultivated, as it is valuable to any garden."

"Look at this plant with the pretty blue flowers!" Dolly pointed, as she spoke, to a plant under the hedge.

"That is the ground-ivy, Dolly. It is called so because it creeps along the ground. Near it you will notice another creeping plant. Its leaves are shaped something like bird's feet. It is called creeping crowfoot. It is really a buttercup.

"Can you guess why these plants come out so early in spring and creep out from the hedge?"

Dolly shook her head.

"Because," Uncle George went on, "the ground here is covered with tall nettles in summer. You can see their faded last year's stems here now.

"The ground-ivy and the creeping crowfoot have to come out early in spring and creep beyond the nettle-bed. If they did not they would be choked by the strong growing nettles. But let us cross this field and see what the farmer's men are doing."

The farmer's men were ploughing the field—slowly turning it from a green field to a brown one. There were two ploughs at work in the field. Each was drawn by three big strong horses. A man held each plough and guided the horses with long reins.

A great flock of crows and other birds followed each plough. They settled on the freshly turned ground just behind the plough. Then, as the plough moved on, they flew after it.

"These birds are having a fine feast," said Uncle George. "They are picking up worms and grubs in the newly turned soil. They are the farmer's friends. For these grubs eat the roots on his crops."

"Why does the farmer plough his fields?" Dolly asked.

"Come into the next field and we shall see," said her uncle.

In the next field a man was harrowing the ground to break the furrows which had been turned up by the plough. This he did by large square frames called harrows, which were pulled by horses. The harrows were set with long teeth and these teeth dragged through the clods of earth and broke them up, so that the tiny roots could easily force their way down through them.

The field was a large one and in part of it a man was sowing wheat by scattering the seed over it, from a box which was made with a lot of little pipes, through which the seed ran down over the prepared ground. He was followed by another man with a harrow which pulled the earth over the seeds, and buried them.

"After that the seeds must be pressed into the soil," said Uncle George. "This is done by rolling it with a huge roller you see at the end of the field. If we come back in about a week we shall find this field quite green with the growing grain."

They next walked through a field of grass. Here many white lambs were skipping about, while their mothers nibbled the tender grass.

"Pretty little creatures!" said Uncle George. "I do n't think any living thing enjoys the merry springtime so much as you do."

"The birds are happy, too," said Dolly.

"All is bustle and joy in springtime," said Uncle George, as they walked home. "The world has awakened from its winter sleep. Everything is glad. Every living thing is busy. The seeds are being sown in fields and gardens. The flowers are peeping out all around. The birds are building their nests. Bees, flies, and beetles come out

DOLLY WAS PICKING WILD FLOWERS

into the warm sunshine. The woods, fields, and hedges grow greener and brighter day by day. Spring is the morning of the year."

QUESTIONS AND EXERCISES

1. Can you name any plants that put forth their flowers before their leaves?
2. Draw the leaf of (1) hepatica, (2) ground-ivy, and (3) wild columbine.
3. Describe how grain is sown in the field.
4. Why is springtime called "the morning of the year"?
5. Why did the crows follow the ploughman?
6. Why did the farmer plough?

LESSON VI—CHICKS

THE old hen was sitting close on her eggs. She had been sitting there for more than two weeks, puffing out her feathers and spreading her wings, so as to cover her twelve large white eggs.

Only when Dolly's mother went to feed her would she leave her nest. Then she only left it for a very short time.

"Why is she so eager to get back to her nest, mother?" Dolly asked.

"Because her eggs must be kept warm. If they were left to grow cold, no chickens would come out of them."

"I wonder she is not tired of sitting there," said Dolly. "How long has she been sitting now?"

"Nearly three weeks," replied her mother.

"And when will the chicks come out?"

While the hen was feeding, Dolly's mother took an egg out of the nest and handed it to Dolly. It felt very warm.

"Hold it to your ear, Dolly," she said. When Dolly did so she heard "cheep, cheep, cheep," from inside the egg.

"Oh, mother," she cried, "there's a chick inside. I can hear it chirping quite plainly."

Dolly's mother smiled. "Listen again, dear."

"Yes, I hear 'tap, tap, tap.' The chick is pecking at the hard shell, trying to get out. Oh, mother, do let us break the shell and let it out."

Dolly's mother shook her head. "No, my child, we must not do that. It would die if we did."

"But it cannot break the shell itself," said Dolly.

"Oh, yes, it can. If you look at the egg with care you will see a little crack."

Dolly looked, and sure enough, near the broad end of the egg, she saw a little mark. It was not a crack, but a small star of tiny cracks.

"I thought," said Dolly, "that the mother hen cracked the shell to let the chicken out."

"Oh, no, Dolly, every chick breaks its own shell. You will see when the chicks come out, that every chick has a small hard scale on the point of its bill. This scale is shaped like a canary-seed. It is very hard. After the chick comes out this scale drops off."

"Then it must be there just for breaking the shell with," said Dolly.

Dolly's mother took up another egg. In this one there was a small hole, in just about the same part of the egg where the crack in the other was.

Looking into the hole, Dolly could see a little yellow bill with a white thing on the tip of it.

"But the chick can't come through that little hole, mother," she said.

"No, my dear, the chick moves round in the egg, and keeps tapping until the top part of the shell comes off. Then the chick comes out."

"That is very strange," said Dolly. "It can't have much room in there to tap."

"It has very little room. Its head is under its wing all the time it is tapping at the shell.

"Watch the hen getting back to her nest. See how gently she treads on her eggs; and how she tucks them all under her with her bill."

Next morning Dolly and her mother went to feed the old hen. When the hen came off the nest, instead of twelve white eggs there were ten fluffy little yellow chicks to be seen.

Next day the hen left the nest, and all her chicks ran as fast as they could behind her. Dolly watched them nearly all day long. She threw crumbs to them, and the chicks ran to pick them up. She brought her uncle and her brothers out to see them.

"The hen is very kind to her little ones," said Dolly to Uncle George. "When she finds a big crumb, she calls her chicks and shares it among them. She teaches them how to scrape up the ground for worms and other food. She drives all other animals away; and when her chicks are tired, she takes them all under her wings."

"What a lot you have learned by watching your hen and chicks, Dolly!" said Uncle George.

QUESTIONS

1. How long did the hen take to hatch her chicks?
2. How does the chick manage to break the egg-shell?
3. Name some birds that can run about and pick up food soon after they are hatched. Can all young birds do this?

THERE WERE TEN FLUFFY CHICKS

LESSON VII—WILD RABBITS

"Oh, Uncle George, we have something to show you," said Frank.

"What is it, Frank?"

"A wild rabbit's nest," said Frank. "Jim, the farmer's boy, showed it to us. It is in a hole far down in the ground. There are eight little rabbits in it, all quite blind."

"We must go and see it, Dolly," said Uncle George. "We will go to the rabbits' nest first. Then we will go round to the green hill where the big rabbits live."

When they came to the field, Frank and Tom went to point out the nest. It was in a hole in the ground. The mouth of this hole was hidden by a piece of dry turf, so that it was not easy to find.

"Mother rabbit is away from home," said Uncle George. "She always closes the door of her house when she goes out, to hide the place where her little ones are sleeping."

Frank took off his jacket and put his arm right down the hole. He had to lie flat on the ground to do this. He took out a tiny rabbit and gave it to Dolly to look at.

"Oh, what a dear little bunnie," said Dolly. "Why, it is not a bit like a rabbit. It is quite smooth, and almost black. It has no fur. Its ears are short and its eyes are shut. May I take it home, Uncle George?"

"No, no, Dolly! It would be sure to die. No one but its own mother knows how to nurse and feed it. But we can come and see these little rabbits another time. Put it back into its warm nest with its little brothers and sisters, Frank.

"Now, let us go and see the big rabbits."

The place where the big rabbits lived was far away from the nest. It was a green hilly place full of big holes. There was a low wall in front of it. Uncle George and his three little friends hid behind this wall. They could see the rabbits hopping about.

When Uncle George clapped his hands, all the rabbits popped into their holes.

"Rabbits must be very timid," said Tom.

"Yes," said Uncle George, "they have many foes. Men shoot and trap them. They have no sharp claws or cruel teeth like the cat. So they have to run from cats and dogs."

"Is that why they make those long holes in the ground?" Frank asked.

"Yes, if they had not holes to run into they would soon all be killed.

"Fear makes them very cunning. They can smell their foes a long way off. With their great ears they can hear much better than we can."

"How do they make these deep holes, Uncle George?" asked Tom.

"The rabbit has very strong paws, Tom. With these paws he can scrape a hole in sandy ground very quickly. All these holes meet under the ground, so that a rabbit can go in by one hole and come out by another.

"Rabbits live together in large numbers. The place where the rabbits live is called a 'warren.'

"Rabbits have so many foes that they are afraid to go far from their holes during the day. They come out at night to feed."

A week after this the children went again to see the rabbits' nest in the field. A great change had come over the little rabbits.

They were now covered with brown fur. Their eyes were open, and their ears had grown very long. They had small white tails.

The next time they went they found the nest empty.

"Their mother has taken them to the warren," said Uncle George. "There they will learn the ways of the big rabbits."

QUESTIONS

1. Where does the mother rabbit make her nest?
2. Can you tell why the rabbit only comes out to feed at night?
3. Name the foes of the wild rabbit.

LESSON VIII—A USEFUL LITTLE BEETLE

One sunny day Dolly was playing in the garden. Her uncle was working among the flowers. All at once Dolly called out:

"Oh, do come here, Uncle George! There is such a pretty little creature on this branch."

Uncle George came to look. "Oh," he said, "that is a useful little beetle called a ladybird."

"A beetle, Uncle George? I thought all beetles were black."

"Oh, no, Dolly; we have brown beetles, yellow beetles, green beetles, and even golden beetles."

"This one is red, and there are, one, two, three, four, five, six, seven black spots on it," said Dolly. "But it is not shaped like a beetle, Uncle

OFF FOR A DAY'S FUN

George. It is more like the half of a little red ball. It has no head."

"Oh, yes, it has," said Uncle George, laughing. "But its head is so close to its body, that head and body seem to be one. Look! It is crawling up the branch. Now, you can count its legs."

"It has three legs on each side—six legs in all," said Dolly.

"That is right," said Uncle George. Then he took the ladybird in his hand, and lo! it tucked its six legs under its body.

Uncle George turned it over. Dolly then saw that the underside of its body was flat and dark gray in color. It lay so still that Dolly thought it was dead.

Uncle George picked it up, and put it on the back of Dolly's hand. He then told her to hold it out in the sun and watch it closely.

While she was doing so, Uncle George sang:

"Ladybird, ladybird,
Fly away home;
Your house is on fire
And your children all gone."

Then a very strange thing took place. The red parts of the ladybird's body moved apart. Inside these, two large thin wings were neatly folded up. It spread out these wings, and flew away into the bright sunshine.

"Well, that is funny," said Dolly. "I did not know that beetles could fly."

"Oh, yes, Dolly, nearly all beetles can fly. They keep their wings neatly tucked up out of sight. Those round red things with the seven black spots on them are the ladybird's wing-cases.

"Look! here is another ladybird. This one has only two spots on its wing-cases. So you see there is more than one kind of ladybird."

Uncle George placed Lady Two Spots on Dolly's hand also, and Dolly held it up to the light. In less than a minute, up went its red wing-cases, out came the big wings, and away it flew.

"It did not wait for me to sing the song," said Dolly.

"You don't need to say the rhyme," said Uncle George.

"Then what is it makes it fly away?" asked Dolly.

"The bright sunshine, of course. Ladybirds only fly when the sun shines brightly. When the light is dull, they fold up their wings and creep about."

"You called it a useful little beetle, Uncle George."

"So it is, my dear. Look at this."

Uncle George pulled down a small branch of a rose-bush. It was covered all over with small green insects.

"Oh," said Dolly, "these are the little insects that spoil mother's flowers. She calls them greenflies."

"They would spoil everything in the garden if it were not for the ladybirds," said Uncle George.

"This useful little beetle eats the greenfly up, and stops them from doing too much harm.

"If there were no ladybirds, we should not have so many pretty flowers."

QUESTIONS

1. Where does the ladybird keep its wings?
2. Why are they covered up?
3. The ladybird is a useful insect. Can you tell how?

LESSON IX—WEEDS

"The garden looks prettier now," said Dolly, as she helped her Uncle George to carry a great heap of weeds to the end of the garden.

"I think I know now why we pull up the weeds. It is because they help to hide the flowers of the garden. Is it not, Uncle George?"

"Yes, our garden does look much nicer," her uncle replied. "No garden looks well if weeds grow in it. And the garden plants are better seen when the weeds are taken away.

"That is one reason why we pull up the weeds, Dolly! But it is not the chief reason. These weeds do more than hide the flowers.

"They rob them of their food.

"Our green plants take much of their food from the air. They also draw some food and all their water from the ground or soil.

"If we were to let the weeds grow up they would use this food, and our garden plants would starve.

"Besides this, they would by and by grow up around the garden plants and rob them of light and air."

"But our garden plants also grow up," said Dolly.

"Yes, but not nearly so quickly as the weeds, Dolly."

"How is it that the weeds grow more quickly than the garden plants?" Dolly asked.

"Because," her uncle replied, "they find conditions better for their growth. Our useful garden plants are strangers brought from other countries.

DOLLY HELPS UNCLE GEORGE WITH THE GARDEN

They do not thrive so well as the wild plants, as they require more care to make them grow.

"We grow garden plants either for their beauty or for food, and so we must let them get all the plant-food and light and air they can.

"That is why we pull up the weeds."

"Are weeds of no use, then, Uncle George?"

"Oh, yes, dear! everything that lives and grows in the world is of some use.

"We only call them weeds when we find them growing in the garden or in the fields among our food-plants. We do not call them weeds when we find them growing in the woods or by the roadside.

"A weed is just a plant in the wrong place. We do not want thistles or daisies in our garden; but we like to see them growing outside. Our country roads, fields, and woods would be dull indeed if there were no weeds to make them beautiful. Many of our common weeds are very beautiful flowers.

"Then most of our little birds feed upon the seeds of these wild plants. If there were no weeds these little birds would leave us. Then there would be no flowers and very little music in the woods."

"I should not like that," said Dolly. "Our walks would not be nice if there were no flowers or birds about."

"Besides that," said Uncle George, "weeds afford food for many animals. Some weeds are useful to us for food, and some are used for curing people when they are sick. Many of our best medicines are made from weeds.

"Let us see what we have in this heap which we are going to burn. Here is the daisy. In the fields it is one of our best wild flowers. Its seeds are eaten by birds. Near it are the dock, the thistle, chickweed, and groundsel. The seeds of all these form the food of our song-birds. Here is a plant very like the groundsel, but much larger and finer. It is the ragwort. This is a very lovely flower. If it were not so common in our fields we should prize it more than we do.

"Wild rabbits eat grass, dandelions, and clover, and we have all these in our heap of weeds.

"Here is a pretty little dog-violet. We should not call it a weed if we saw it by the brook.

"Some of our weeds have small flowers—so small that we do not often take the trouble to look at them. But the bees visit them always for honey.

"The shepherd's-purse is one of our most common weeds. It is a very pretty plant. It is a cousin to our beautiful wallflowers.

"Some of our garden flowers are the grandchildren of common weeds. Our fine pansies have come from the wild violet. Our roses have all sprung from the wild rose of the wayside. And I am not quite sure that the grand roses of the garden are half so pretty as our wild roses.

"The wheat, from which our bread is made, was once a wild-growing plant. In fact, most of our food-plants were at first weeds, and their cousins can still be found growing wild.

"The carrot, the turnip, the beet, the parsnip, the cabbage, and many other useful plants came from wild plants.

"Many of our finest garden flowers are found growing wild in other lands. In the gardens of their native land they might be called weeds.

"Our apples, pears, plums, cherries, strawberries, gooseberries, and raspberries have all come from the woods and wilds."

QUESTIONS AND EXERCISES

1. What are weeds? Name some common weeds, and tell if they are useful.
2. What useful food-plants come from wild plants?
3. Make a list of the wild fruits you have found.
4. What wild flowers growing in the fields can you name?

LESSON X—THE BUMBLEBEE

One evening Dolly was plucking wild flowers in a lane quite near her home. All at once a big bee came out of one of the flowers she had pulled. Instead of flying away, it went into another of her flowers.

"Oh, come here, Uncle George," she cried, "I have got a big bee, and it is quite tame."

As she spoke the bee flew to a mossy bank which was near. Before Uncle George came up it went into a small hole near the top of the bank. Then another large bee flew up and went into the same hole.

"You have found a bumblebee's nest," said Uncle George.

Dolly and her uncle sat near the hole and watched. As they watched they saw many bees enter the nest; while some came out and flew to the flowers.

There was a large flat stone on the top of the bank right over the little hole. Uncle George

struck this with his hand. At once they heard a loud hum which came from under the stone. Many bees came out of the hole and flew angrily about.

Uncle George told Dolly to run home and fetch him a wine-glass.

When she came back he caught one of the bees and put it under the glass. Then he lifted up the large flat-stone from the bank. Under it Dolly saw a lot of dry moss.

"We must be careful not to spoil the nest," he said.

Uncle George then took some of the moss gently away. A great many large bees and some very small ones came flying out. Then Dolly saw, among the moss, a lot of finger-shaped cells. Some of these were filled with honey. Others had each a large ugly white grub with a brown head.

"These grubs," said Uncle George, "are the young bees."

"I thought those little bees were the young ones," said Dolly.

"Those are worker bees and soldiers," said Uncle George. "They never grow bigger. They feed the young and guard the nest. Sometimes they go out and gather honey.

"But they are getting angry. They will sting us if we trouble them much more."

Uncle George then put back the covering of dry moss, and gently replaced the flat stone. The bees flew about the nest for a long time. At last they went in, by the hole, one by one.

"Now," he said, "let us look at this bee in the glass; and then we will set it free."

"It is much larger than any of our hive-bees," said Dolly.

"Yes, and it is quite unlike them in color and shape."

"It is black in color," said Dolly, "and covered all over with silky hair. It has a broad yellow band behind its head, and another just under its wings. The end of its body is white."

"Go on, Dolly, that is very good," said her uncle.

"It has three pairs of strong legs. There are two things like slender horns sticking out from its head; and two large black eyes, one on each side of its head."

"Stop a minute, Dolly," said Uncle George. "These slender things are its feelers. By means of these it can feel and smell. Those two large black oval eyes are not like our eyes. Each of them is a number of small eyes all packed together. The eye of a bee is made up of hundreds of small eyes."

"What small clear wings he has. And what are those yellow patches on his legs?"

"His wings are very small indeed," said Uncle George. "In fact, it is a wonder that so big an insect can fly with such tiny wings."

"Do the bumblebees store up honey for the winter?"

"Alas, no, Dolly, if we come back to this nest in winter-time we shall find only dead bees and empty cells."

"That is very sad," said Dolly. "Do they all die?"

"No, not all. The young female bees fly away before winter comes in. They bury themselves in the ground. In spring, the young queen or female bee wakes up.

"She looks for a hole in the ground or under a stone. Here she builds her nest and lays her eggs.

"Out of these eggs come young bees, who help her to make a large nest like this one.

"Bumblebees work very hard. Long before the hive-bee is up, the bumblebee is out gathering pollen and honey.

"Long after hive-bees have gone to rest, you can see the bumblebees flying from flower to flower.

QUESTIONS AND EXERCISES

1. Describe the bumblebee. Compare it with the hive-bee.
2. Describe the eyes of a bumblebee. In what respect do they differ from your own?
3. What are young bees like?
4. Where are the bumblebees during winter?

LESSON XI—HOW THE FIRE BURNS

It was a cold wet day—so cold and wet that neither Dolly nor her brothers could venture out. They had grown tired of reading books and drawing pictures, and were indeed feeling very dull. They sat looking at the bright fire. Uncle George laid down his paper and said:

"Come, let us have a lesson. What shall it be? The rain? The cat? Or shall it be the cozy fireside?"

"The fire," said Frank. "Tell us why the fire burns, Uncle George."

"I will," said cheery Uncle George. "Just wait until I get some things from the kitchen. Come along, boys."

When Uncle George and the boys came back to the room, they brought a lot of curious articles with them. These were an empty pickle-bottle, a small saucer, a glass bell-jar, and a large dish, a piece of candle, some tacks, and a taper.

"Now," said Uncle George, "we are ready to begin."

He first lighted the piece of candle and lowered it into the bottle. It burned for a short time, then it went out.

"Can you tell me why it goes out?" he asked.

"Want of air," said Tom and Frank at the same time.

"But there is air in the bottle," said Uncle George.

"Yes, but not the kind of air the candle wants," said Frank.

"That is a queer answer, Frank. The candle burned for a time in the bottle before it went out."

"Because it used up that part of the air which makes things burn," said Frank.

"That is very good," said Uncle George.

Uncle George then poured some water into the large dish. He fixed the candle on a big cork, lighted it, and set it floating on the water. Then he placed the glass bell-jar over it. But first of all he marked the level of the water on the outside of the bell-jar.

Very soon the flame of the candle became small, and at last it went out. Just then the water inside the bell-jar rose far up above Uncle George's mark. He marked this new level, and asked the boys if they could tell him why the water rose in the jar.

Both Frank and Tom shook their heads sadly.

"Then I must explain," said Uncle George.

"Some of the air has gone," said Tom.

"Yes," said Uncle George. "How much of the air has gone?"

Frank pointed to the space between the two marks.

"That is right," said Uncle George. "The water has risen up in the bell-jar to take the place of the air that has been used up by the burning of the candle. Where has this used-up air gone?"

"It must have gone into the water," said Tom.

"Why did it not go into the water before the candle burned?"

"Perhaps the burning of the candle has changed this part of the air," said Frank.

"Very good, Frank. You are right again. The burning of the candle has changed a certain part of the air. It has, indeed, so changed it that it can dissolve in water just as if it were sugar or salt."

Uncle George now poured water into the outer dish until it was level with the water inside the bell-jar. Then he took out the stopper and pushed a lighted taper into the bell-jar. The taper at once went out.

"This shows us," he said, "that a part of the air causes things to burn. The other part of the air does not. It puts burning things out. If we blow the fire with a bellows or fan, it burns more brightly and quickly. Why? Just because we are forcing a stream of air upon it, and a part of that stream of air is changed by the burning."

Uncle George next put some bright iron tacks in a small dish. He poured some water out of the large dish, and placed the bell-jar in the dish. After that he added water until it was just up to his first mark on the bell-jar.

Then he floated the dish with the tacks on the water. Next he wetted the tacks with water, and then placed the bell-jar over them and put in the stopper.

"Now," he said, "we will leave this just as it is for a few days."

The boys watched the bell-jar every day, and this is what they saw: The water rose slowly in the bell-jar. As it rose the bright tacks turned red with rust. The water rose higher and the tacks turned redder every day.

At length it rose to Uncle George's second mark. It rose no farther, although left for a whole week.

Then Uncle George called the boys and asked them what had taken place in the bell-jar.

"The tacks have rusted, and some of the air in the jar has been used up," said Frank.

"How much air has been used up?" Uncle George asked.

"Just exactly the same as was used up when we burn the candle," said Tom, pointing to the top mark.

"Let us see, then," said Uncle George, "what part of the air has gone."

He poured water into the large dish until it was level with the water inside the bell-jar. Then he put a lighted paper into the bell-jar as before. It went out at once.

"It is the same part of the air as the burning candle used up," said Frank.

"Then we have found out," said Uncle George, "that when a thing burns it uses up a certain part of the air; and that when iron rusts, exactly the same part of the air is used up.

"In the first case, the burning of the candle changed part of the air into a gas which dissolved in the water. In this case, that same part of the air has joined up to part of the iron tacks to form the red powder which we call rust."

QUESTIONS AND EXERCISES

1. How is rust formed?
2. Explain why things which are made of iron should be painted.
3. A grate full of coals burns away and only a small quantity of ash is left in the grate. What has become of the coals?
4. Why will a rug smother a fire?

LESSON XII—THE GREAT WATER-BEETLE

DURING the summer the boys paid many visits to the pond. Each time they went there they saw something to interest them.

Their uncle taught them to keep perfectly still while looking into the water. They soon came to know that this was the best way to study pond-life, for, whenever they moved, the creatures they were watching would dart out of sight.

One day, while they were both lying on the bank gazing into the pond, a huge black beetle came up to the surface of the water. It remained there for a few moments, with its head hanging downward and its tail sticking right out of the water. Then it dived down out of sight. In a few minutes it came up again, and this time Frank's net was under it before it could escape.

Just as Frank was putting it into the glass jar, Tom whispered, "Here is another one—quick, Frank!"

But Frank was too late; for before he could get the first beetle into the jar the second one had dived to the bottom of the pond. The boys waited for a long time, hoping to see the other beetle again. At last their patience was rewarded. The beetle came up again to the surface. As soon as it did so, in went the net, and out came beetle number two.

"What big beauties," said Frank. "I wonder what they are. Let us hurry home and show them to Uncle George."

When they got home, their uncle placed the two beetles in a glass tank by themselves, so that they could be more easily observed.

"What do you call them, uncle?" asked Frank. "We have never seen such large, handsome beetles before."

"Have you not?" his uncle replied. "I am surprised at that, for this beetle is found in nearly all our ponds and ditches. It has a long Latin name, which means 'bordered diver,' but it is commonly known as the diving beetle. There are several kinds of these diving beetles. This is the largest. Can you give me an idea of their size?"

And Uncle George handed Frank a small measuring-rule which he carried in his pocket.

Frank looked at the beetles, and then moved his thumb-nail along the rule.

"About an inch and a half in length," he said.

"That is about right," said his uncle. "Are these two beetles exactly alike?".

"They are both about the same shape and color. One is slightly bigger than the other. They are both greenish-black above and brown below. There is a curious broad border of yellow all round the edge of their bodies," said Tom.

"But they are not both exactly alike," said Frank. "I notice that one is smooth on the back, while the other's back is all grooved."

"You are right, Frank," said Uncle George. "The one with the grooved wing-cases is the female. The one with the smooth cases is the male.

"Notice the long legs they have for swimming, and how they seem to oar themselves through the water. Notice also that the male has a large flat disk upon each of his forelegs. These are suckers, by which he can cling to things."

"Why do they come up to the surface so often?" Frank asked.

"They cannot live without air. They carry a supply of air under their wing-cases. They just come up to renew it from time to time. This is done by thrusting the end of their bodies out of the water, as you quite easily may see."

"One would think they ought to thrust their heads out to get air," said Tom.

"That seems most natural to us, because we breathe with our mouths," said Uncle George. "These animals take in air with their tails. A great many pond-insects breathe in this curious way."

"What do they feed upon?" Frank asked.

"They are fierce, greedy creatures," his uncle replied. "They attack and kill worms, tadpoles, and even small fishes."

Uncle George threw a small worm into the tank. One of the beetles seized it at once and began to devour it greedily. Presently the other beetle seized an end of the worm. The boys watched closely, and saw that the beetles' jaws moved from side to side like a pair of pincers.

Next morning, when Uncle George and the boys went in to see the beetles, they found only one in the tank. The other had escaped during the night. After a careful search they found it, at the far end of the room, dead.

"Now, how do you think this beetle managed

to get out of the tank and travel all that way?" Uncle George asked.

"It must have crawled up the inside of the tank, then down the outside. Then it must have fallen off the window-sill, and crawled right across the floor," said Frank.

Uncle George shook his head.

"It might," he said, "have managed to crawl up to the edge of the tank so long as its legs were wet. But as its long legs are made for swimming, and not for crawling with, I can hardly see how it could have crawled or walked all that distance."

"Then, how did it get there, Uncle George?"

In answer to Frank's question, his uncle took the dead beetle, and placed it on a piece of paper on the table. He next moved aside each of the large black wing-cases with a pin.

Underneath these wing-cases the boys saw a pair of large wings neatly folded up. Uncle George removed one of the wing-cases, and unfolded one of the wings. Stretched out, it was longer than the beetle's body, and it seemed to be made up of thin, clear skin, stretched on a framework of long, thin supports.

"Why, these beetles can fly," said Tom.

"Of course they can," said his uncle. "All beetles can fly. This creature has evidently been flying about the room all night. These insects are furnished with wings, so that they may be able to fly to another pool when food gets scarce, or when their pool dries up."

QUESTIONS AND EXERCISES

1. Would you keep water-beetles, tadpoles, and very small fishes together? Give your reasons.
2. Water-beetles cannot live without air. Explain how they get it.
3. Compare the legs of a water-beetle with those of any of our garden-beetles.
4. Why are water-beetles furnished with wings?

LESSON XIII—OTHER INTERESTING TREES AND TALKS

"Let us go and see how the men are getting on with the maple-sugar," said Uncle George, one morning in February.

Off they all went to the woods, and the children ran fast to keep warm. When they reached the place where the men were working they found large fires built under sheds, on which were sitting large kettles. On some of the trees were hanging pails. The children went over and looked into the pails.

"What are these pails for?" asked Dolly.

"The water you see coming out of the tree is the sap," said Uncle George. "The men catch the sap and boil it down. That makes the maple-sugar you like so much. I want you to notice how the old bark is deeply furrowed, and very shaggy. Do you see those peculiar wings on the ground, which look like an insect's wings?"

"Yes, I do," said Frank, "and they have something hard, where they are joined."

"Those are the fruit of the tree. The wings are to carry the seed away by the wind. The flowers of these trees will come out in April or May, but they are green. The leaves, however, have five points. I want you to take up some from the ground, so that we can draw them when we get home. The leaves of this tree change their color in the fall; some become yellow and then orange, and others become red and then crimson. Sometimes the entire leaf does not change, but all kinds of colors will appear on one tree."

One morning in May everything seemed to be out and bright. The birds were singing, the meadows were covered with pussytoes, yellow star-grass, and buttercups. Dolly thought the trees were a long time coming out.

"See that large tree over there with the small green leaves just appearing. What are those strings hanging from the branches?" asked Dolly.

"That is an oak tree," said her uncle, "and those strings are the flowers. The oak has two kinds of flowers. They are both green, and not pretty like the flowers of the garden. The acorns come from small green flowers found close to the bark."

"The oak tree," continued Uncle George, "is called the king of the forest. See how thick the trunk is. See the strong branches. Notice how high it grows. When all the leaves are out it is certainly most beautiful and grand."

"What does the chestnut tree look like?" asked Tom, as they were walking out one spring day.

"Here is one," said his uncle, as he walked up to a very large tree with very rough bark, having many ridges. "See the oval leaf with sharp-pointed teeth."

"What kind of flowers does it have?" asked Frank.

"The flowers are long drooping cylinders, cream-colored, and very fragrant. They do not appear until late in June or July. Do you see that burr on the ground, Tom? That is a burr that held a nut. When the burr opens, the nut

drops out. You will be able to gather the nuts in September."

It was Christmas-time, and the children had their thoughts on the wonderful tree which would be lighted up on Christmas evening.

"Where do these trees come from?" asked Frank, one day, as they saw a great load of them pass up the road.

"Out of the woods," said Uncle George. "They are called evergreen because they stay green all the year. To-morrow we will go out and look at some of them."

The next morning, bright and early, the children started out. Everything was covered with snow; all the evergreens had on their white mantles. They stopped when they came to a small spruce.

"There," said Uncle George, "is a tree similar to what you saw in the wagon. It is the spruce tree, and the old trees grow over one hundred feet high. What kind of leaves do you find there?"

"They seem to be four-sided, and dark green," said Frank. "They do not seem to be so long as those you showed us the other day."

"No," said Uncle George. "Those I showed you then were pine-needles. Do you see any cones on that tree?"

"Yes," said Tom, "I see one here, but under the tree I see a great many more."

"How big are the cones?"

"They are about two inches long. They feel soft when you press them."

"Right again," said Uncle George. "The little leaves of the cone we call scales. They are not very hard. The seeds have fallen out of the cones, and the cones have fallen off the tree. There are not many branches on the lower part of the trunk, because the other trees around cut off the light. All the branches are at the top. If this tree were growing in the open wood, you would find branches down the trunk within a few feet of the ground. Take home a cone and draw it."

"There is a tree with a very white bark," said Tom, as they continued their walk. "Has somebody painted it white?"

"No," said his uncle, "that is the white birch, and its bark is very valuable."

"Does it have any flowers?" asked Frank.

"Yes, it has long, hanging, green flowers that appear in April before the leaves come out. It has flowers of another kind which produce the little club-shaped tufts that look like a bunch of scales."

"Papa spoke of a birch canoe. Does that come from this tree?" asked Dolly.

"Yes," said her uncle; "the bark of this tree makes light, water-tight canoes. Hunters frequently use it to roof their cabins. The inside bark can be used to write upon, and in olden times people made books of that paper."

QUESTIONS

1. What tree gives us sugar? When do people gather it?
2. How could you tell an oak tree?
3. What kind of fruit does the chestnut tree have? How are they cooked?
4. What are evergreen trees? What kind of fruit do they have?
5. Tell something about the white birch.

Photographed by H. Armstrong Roberts

IN THE GARDEN

LITTLE NATURE LESSONS

LESSON I—ABOUT THE AIR

Tom and Dick were twin boys. They lived at a farm-house in the country.

They went to the village school, and were in the same class. They were very fond of their school and their lessons.

When school was over for the day, their father, the farmer, liked them to tell him about their lessons.

"What have you been learning to-day, boys?" he would ask.

One evening Dick said, with a laugh, "We had a lesson to-day about something we can't see. Guess what it was, father."

But his father only began to scratch his head. At last he said, "That 's too big a puzzle for me, Dick. Give it up."

"Well, it was about the air, and we can't see that. Can we?" said Dick.

"Teacher pushed the mouth of an empty bottle down into the water. But he could not make the water go right up, and fill the bottle, till he slanted it. Then bubbles rose, and the water rushed in.

"The bottle was not really empty, as it seemed to be. It was full of air, you know. So there was not room for all the water to get in. It was the air from the bottle that made those bubbles. As the air passed out, it made room for the water."

"Yes, teacher says there is air everywhere," added Tom. "He pushed a dry sponge down into the water, and bubbles rose up from that. As the water filled up the holes in the sponge, it forced out the air that was in them. That air made the bubbles."

"Yes," said Dick, "air is a real thing, and it is everywhere. We cannot see it, and we do not feel it, when we sit still. But we can feel it when we move about."

"We feel it, too," said Tom, "if teacher waves a fan in front of us, or blows the bellows in our faces. We feel the air then because it is moving. When the air moves, it makes other things move, too. The bellows moved the air, and the moving air sent a little boat along on the water."

"You say air is a real thing," said his father. "Now all the real things I know, such as stones, wood, clay, and water, weigh something. Does this air you are talking about weigh anything?"

"Yes, father, it does," said both the boys. "We saw teacher weigh it."

"Oh, how did he manage that?"

"Well, he put a big glass bottle into the scales," said Tom, "and weighed it, just as we weigh other things."

"Do n't forget," said Dick, "the bottle was not really empty. It was full of air."

"Yes, of course it was," said Tom. "And when teacher stood it over the spirit lamp, we thought every minute it would burst. But it did not burst, and when he weighed it again, it was not so heavy. The air had been forced out of it, and that made it lighter than it was at first.

"Of course, this proves that the air weighs something. Does n't it?"

"Do you know what would happen if all the air could be forced out of this room?" asked their father, noting the interested and eager expressions on the faces of both Tom and Dick.

"We should choke and die," they both replied. "We breathe air. We could not live without air."

REVIEW OF THE LESSON

1. There is air everywhere, although we cannot see it.
2. Air is a real thing and takes up room.
3. Air, like every other thing, has weight.
4. Air can be felt when it is moving about.
5. When air moves it makes other things move.
6. We breathe air.

LESSON II—THE SKY

One morning the two boys were at play, when their father came along.

"Shall we go for a ramble?" he asked. "I hear there is no school to-day."

Dick and Tom were ready in a moment. They liked nothing better than a ramble with father. He could always find something new to show them. He told them there was much to learn, even from common things in the roadway and in the fields.

Some people would pass by these things without notice. But he used to say he wanted his boys to learn to go about the world with their eyes open.

It was just the sort of a day for a long ramble. They walked on and on, chatting as they went, till father said:

"Let us sit down on this fallen tree for a rest; you must be tired."

"What a lovely blue sky," said Dick, as they sat there. "It looks to me like a big blue basin placed upside down. It seems to cover the earth all over, like a great round roof, and we are sitting just under the middle of it."

"What is the sky made of?" asked Tom.

"Why, the sky is only the air, which is all round us," said his father. "It stretches up and up, ever so high. But do you know what those white patches are in the sky?"

"Oh, yes," said Tom. "They are clouds; rain comes from the clouds. When it is very cold, the clouds send us snow and hail instead of rain. The clouds cover the blue sky, and hide it from us when rain is coming."

"Yes, and they sometimes hide the sun, too," said his father. "It is warm and bright now, because the sun is shining. But when the clouds shut out the sun, it is cold and dull. The sun, you know, gives us warmth and light."

"Yes, and at night when we cannot see the sun," said Dick, "the moon and stars shine in the sky, and give us light."

"The moon is not so bright as the sun," said Tom. "It is white and silvery. We can look at it without hurting our eyes, but we cannot look at the bright sun. It is like a great round ball of fire."

"The moon, you know, changes its shape," said their father. "Take this chalk, and draw the moon as we sometimes see it. When it is this shape, we call it a New Moon. This one we call a Half Moon, and when it is round like a ball, we call it a Full Moon."

"I think the stars are like tiny lamps dotted over the sky," said Dick. "They shine and twinkle all night long. What a number of stars there are in the sky!"

"Yes," said his father, "but sometimes the clouds shut out the moon and stars, and then the night is very dark."

REVIEW OF THE LESSON

1. The air all round us reaches high above our heads and forms the sky.
2. Clouds float about in the sky. They send the rain.
3. The clouds sometimes send hail and snow.
4. The sun warms us and gives us light in the daytime.
5. The moon and stars give us light at night.

LESSON III—THE SUN

"Would it be always dark and cold, father, if we had no sun at all in the sky?" asked Dick that evening. "It always gets dark and cold at night."

"Ah, my lad," said his father, "without the sun this world of ours would be a very cold, dark, dreary place indeed. Nothing could grow, not even a blade of grass. No creature could live in it. It would be a dead world.

"I want you to be up with the lark in the morning," he added. "We will have a scamper before breakfast, and learn about the sun."

So away they went to bed, and before daylight they were trudging across the fields with their father.

All at once he stopped, and pointed straight in front of them.

"Look," he said; "our friend the sun is just getting up. Stand still, and watch the great round ball come up, little by little. We say the sun is rising. I know where to look for it," he added, "for it always rises in the same place. We call that the east. The sun is very low down, near the earth now, but it is not always low down like this. In fact, it has been getting higher, ever since we first saw it."

"Yes," said Dick, "and we sometimes see the sun very high in the sky."

"Do you know when the sun is highest?" asked his father. "It reaches its highest point in the sky at twelve o'clock every day. That part of the day we call noon."

"Then I suppose fore-noon means before twelve o'clock, and after-noon after twelve o'clock," said Tom.

"Right," said his father. "Now where do we see the sun in the evening?"

"It is low down in the sky then, near the earth," said Dick.

"True," said his father, "but we do not find it then in the east part of the sky. Point to the sun now with your right hand, and then stretch out your left hand in a line with it. Your left hand is now pointing to the part of the sky where you must look for the sun in the evening. We call that the west.

"Every day it seems to travel across the sky in a great curve. It reaches the top of the curve at noon, and all the afternoon it gets lower and lower. Then as the evening comes on, it sinks down out of sight in the west. We say the sun sets in the west.

"So the sun rises every morning in the east, and sets every evening in the west.

"When you look toward the sun at mid-day you are facing the south. If then you turn your back to the sun, you will have in front of you the north, where the sun is never seen."

"The clouds must be nearer to us than the sun," said Dick, "for they sometimes hide it from us altogether."

"Yes," said his father. "Sometimes the clouds cover the whole sky, but the sun is up there behind them, shining just the same, though we cannot see it."

REVIEW OF THE LESSON

1. The sun is a great round ball of fire.
2. The clouds are nearer to us than the sun.
3. The sun rises in the east every morning, and sets in the west every evening.
4. The sun is at its highest point in the sky at noon.
5. It is then in the south.
6. When we look toward the south, the north is behind us.
7. We never see the sun in the north.

LESSON IV—THE STARS

"Why does the sun go down?" asked Tom, one evening, as they were coming in from the field.

"Well," said his father, "the earth on which we live is round, and when the sun appears to go down, it is shining on another part of the earth. The other people have day when we have night."

"I do dislike the night," said Dick; "everything is so dark when the sun goes down that we cannot see anything."

"That is a mistake," said his brother. "At night we can see the beautiful stars, those little diamonds which shine all night long."

"Suppose," said their father, "we look at the stars after supper."

Nothing could have pleased the boys better; so after supper they all went out on the porch and looked at the sky. The moon had not risen, and the entire sky seemed to be filled with stars.

"Look toward the north," said their father, "about half way up from the earth. Do you see four stars like the corners of a box that look very bright?"

"Yes," said Tom, "I see them, and there seem to be three others near them."

"That is right," said his father. "These seven stars make what is called the dipper, because together they look something like a dipper. The two front stars are called the pointers, because they point to another bright star right north. That is called the north star. That star does not seem to move, and mariners when at sea look for that star at night, so they can tell which way they are going."

"What are those four bright stars over our heads? They look like an oblong which had been bent out of shape," said Dick.

"You mean like a rhomboid," said his father. "Those stars with a number of others make a group called in olden times Leo, that is, the Lion. It always appears over our heads in April. The sun rises near it in July, and as the heat is then very great, the people thought that this group of stars caused it, and they called the group the Lion because that animal is so fierce. Now look and see if you can find three very bright stars in a row not quite over our heads in the west."

"Yes, I see them," said Dick, "and there seems to be another star which is brighter on one side."

"I see a brighter star on each side," said Tom. "What are those stars?"

"Those five stars, with others, make a group called Orion. This group is named for a very famous hunter of olden times. The three stars form his belt. They also point, and if you will notice to the south you will see a very bright star, brighter than any others. Do you see it? It looks as if it were just above the trees."

"Yes, I see it," said both boys at once. "It looks pure white."

"That is right," said their father. "That star is Sirius, the largest star in the heavens. It is hundreds of times larger than our sun."

"What makes it look so small, then?" said Tom. "I thought these stars were very small. They look like little diamonds."

"Yes," said his father, "they do, but they are so far away that only a little light gets to us."

"Are the stars shining always?" asked Dick.

"They are shining all the time," answered his father; "but, because we get so much more light from the sun, we cannot see them—just as, you know, you cannot see the light of a candle in the daytime. At night, however, as soon as the sun goes down, their light shines out."

REVIEW OF THE LESSON

1. When the sun is shining on the other side of the earth, it is night here and day there. Why is that?
2. Why are the two stars of the dipper called pointers?
3. Why does the mariner want to see the north star?
4. Why do the stars appear to be so small?
5. What is the largest star you can see?
6. Why can you not see the stars in the daytime?

LESSON V—SUNSHINE AND SHADOW

At noon the next day the two boys were standing in the road watching the sun, when their father came along.

"There," said Tom, "that part of the sky, where the sun is now, we call the south; behind us is the north."

"Do n't stand out there in the hot sun, boys," said their father, as he came up. "It is nicer and cooler in the shade."

"What makes the shade?" asked Dick.

"Well," he replied, "the sun cannot shine through trees and walls. It throws a dark patch on the ground. This dark patch is a shade, or a shadow. Go and stand where you were standing just now."

"Why, that must be my shadow on the ground," said Dick.

"Of course it is," said his father. "The sun cannot shine through your body, and so it casts a shadow."

"Why is it cool as well as shady under a tree, father?" asked Tom.

"Because the heat of the sun is shut off, as well as its light," said his father.

"It is just twelve o'clock now," he added. "You know the sun is always at its highest point in the sky at noon. Stand still, and I will measure the length of your shadow on the ground.

"There," he said. "Now, this afternoon you shall measure each other's shadow from time to time."

Evening came, and their father said, "Well, boys, what about the shadows?"

"We took the measure ever so many times, father," said Dick, "but each time it was longer than it was before."

"Yes, my boy, your measure was all right," said their father. "The shadows grew longer, because the sun was getting lower in the sky all the afternoon.

"At noon, when the sun was high up above our heads, it cast short shadows. But just before sunset, when the sun was low down, it shone full on your body, and so threw a long shadow. The noon-day sun in winter is not nearly so high in the sky as it was at noon to-day. What sort of shadows will you expect to see then?"

"Long shadows, father," said Dick.

"Quite right, my lad," said his father; "and now I do n't think you will ever forget that short shadows mean long days, and long shadows short days. The sun mounts higher at noon in the summer than it does in the winter. It rises much earlier and sets much later. The days are longer and warmer in summer than in winter."

REVIEW OF THE LESSON

1. Bodies, through which the light cannot pass, cast shadows on the ground.
2. Bodies which shut off the light of the sun shut off its heat also.

3. When the sun is low in the sky the shadows are long; when the sun is high the shadows are short.

4. The noon shadows in summer are shorter than they are in winter.

5. The sun rises earlier and sets later in the summer than in the winter, and it also mounts higher in the sky at noon.

6. That is why the days are longer and warmer in the summer than in the winter.

LESSON VI—CLOUDS IN THE SKY

"THERE will be no going out to-day," said Tom as he stood at the window. "It *is* coming down, and no mistake."

"Yes, I think it is set for a wet day," said his father. "The sky is covered with thick clouds. Sometimes, you know, there are only a few little white patches of cloud, dotted about over the blue sky."

"How pretty those light fleecy clouds look," said Dick. "They seem to me like loose white wool, or feathers."

"So they do," replied his father; "and they are often called feather clouds."

"I like to watch those great curly clouds, which are sometimes piled up, heap upon heap, in the sky," said Tom.

"Ah, those are called heap clouds," said his father, "and when the sun breaks through them, they look very grand and beautiful. Some clouds are not piled up in curly masses, but stretch across the sky, low down, in beds or layers. Those are known as layer clouds."

"What are clouds made of, father?" asked Dick.

"I will show you," he said. "The kettle is singing on the stove. There, what do you see now coming out of the spout?"

"Oh, that is steam," they both said.

"Well, it is really a little cloud," he replied. "The heat of the fire changes the water into a cloud of steam. Take this wet plate, and hold it in front of the fire. The heat of the fire is making another little cloud."

"What would happen if we stood the wet plate out in the hot sun?"

"The plate would soon get dry," said Dick. "The wet clothes get dry when they are hung out on the line."

"Yes, the heat of the sun changes the water, which makes them wet, into a little cloud. The cloud floats away, as this one does," said his father. "And now, can you tell me why the cloud floats away?"

"I suppose it is because the cloud is lighter than air," said Dick; "all light things float."

"Yes," said his father, "the cloud is light, and the heavy air forces it up. That is why clouds float in the sky."

REVIEW OF THE LESSON

1. There are feather clouds, heap clouds, layer clouds, and rain clouds.

2. Heat changes water into cloud.

3. Clouds float in the sky because they are lighter than the air.

4. The heavy air forces the light cloud upward.

LESSON VII—CLOUDS AND RAIN

"ARE all the clouds in the sky made of steam, like the steam that comes out of the kettle, Maude?" asked her little sister Ella. "Dick says they are."

"So they are," said Dick. "Father told us that the steam, which comes from the kettle, is a real little cloud."

Maude was the eldest of the family at the farm-house. The younger children all looked up to her, for she was so clever, and knew so much about things.

"Ah, wait a bit, Dick," she said with a smile. "Take this slate, and hold it close up against the little cloud, which is puffing out of the spout of the kettle."

"The slate is getting wet," he said, as he held it there. "Little round drops of water are rolling down it, and the water must have come from the steam."

"So it did," said Maude, "and yet that white cloud, which you see, is not steam.

"Look; we cannot see the real steam, when it first puffs out of the spout. We do not see it till it begins to change back into water. Then it forms a cloud, some distance from the spout. This we call vapor—water vapor.

"The air of the room is not so cold as the slate. It could not change the steam into drops of water at once, as the slate did. But it is cold enough to make it begin to change, and in that state it forms a white cloud of water vapor. The heat of the sun changes water into vapor like this. It is vapor—not steam—that rises to form clouds.

"When this vapor of the clouds gets cold, it changes into drops of real water. Water cannot float in the air as vapor does, because it is heavier than the air. It falls in drops of rain."

"I caught some rain-drops on a dusty board, when it was raining, and watched them roll about," said Ella. "The little balls of water do sparkle in the sun."

"Ah," said Maude, "you have all seen a rainbow in the sky. It is the sun shining on the drops of rain, as they fall, that makes those beautiful colors in the rainbow. It is because every rain-drop is a ball, that the bow is curved.

"There is just one thing more," she added. "You have seen the big clouds chasing one another across the sky. Do you know what makes them move? It is the wind that blows them along from one part of the sky to another. This is a good thing, you see, for the rain does not all fall in one place."

REVIEW OF THE LESSON

1. Steam cannot be seen, but vapor can be seen.
2. Vapor changes again into drops of water when it gets cold.
3. Water is heavier than air. The drops of water cannot float in the air. They fall as rain.
4. Rainbows are formed by the sun shining on the round drops of rain, as they fall from the clouds.
5. The wind blows the clouds about from one part of the sky to another. Hence the rain does not all fall in one place.

LESSON VIII—THE WIND AND THE WEATHER

"I KNOW why father has that funny cock-a-doodle on the roof of the barn," said Dick. "It is a weather-cock. It tells him what weather to expect."

"It must be a very clever bird," said Tom. "How does it do that?"

"I will tell you," said his father.

"You see, first of all, there are four arms with the letters N. E. S. W. at the ends of them. These arms are fixed. One points to the north, one to the east, one to the south, and one to the west.

"The bird, you know, is not fixed. It moves round on that spike. Wait a moment. I will make you one."

So saying, he cut out a paper figure of the weather-cock. He then made two small slits in it, and pushed his lead pencil through the slits.

"There," he said; "now blow as hard as you can against the bird, and you will see how it works."

"That 's funny," said Tom. "The bird spins round, and looks me straight in the face. Here, you try it, Dick."

Dick took it and blew. Then his father had a try. But it was still the same. The bird again spun round, and faced him as he blew.

"Can you tell me now why the cock-a-doodle on the roof of the barn spins round?" he asked.

"The wind must blow it round," said Dick.

"Yes, it does," he said, "and you can tell which way the wind is blowing, for the bird always faces the wind."

"But why does it face the wind?" asked Tom. "That 's just the puzzle."

"Well, you see, our paper bird is fixed on the pencil much nearer the head than the tail," said his father. "When we blow, we must blow the big broad tail part away from us, so the head always faces the wind. The weather-cock is fixed in the same way. It must face the wind."

"But what has the wind to do with the weather, father?" asked Tom.

"I will tell you," he said. "The north winds come from a part of the world where there is ice and snow all the year round. They are cold biting winds.

"You know the little song—

> The north wind doth blow,
> And we shall have snow.

"The south winds blow from hot lands, where ice and snow are never seen. They bring us warm weather. The winds from the ocean bring us rain, the winds from land usually are dry winds."

REVIEW OF THE LESSON

1. The weather-cock tells us which way the wind is blowing.

2. The head of the bird always faces the wind.
3. When we know the direction from which the wind is blowing, we know what weather is coming.
4. The north wind brings cold weather; the south wind warm weather.
5. Winds from the ocean bring rain clouds.

LESSON IX—THINGS THAT GROW IN THE GROUND

One morning the two boys watched Maude, as she came along the garden path, with a bunch of flowers in her hand.

"What lovely flowers," said Dick.

"Yes," she replied, "they are lovely indeed. I have just cut them for the table. I am so fond of flowers."

"So am I," said both the boys.

"Well," she said, "my garden work is done for to-day. Shall we have a little chat about flowers now?"

"Oh, yes, please," they replied.

"I think every one must love flowers," she said. "They are so beautiful. Look at them. They are white, red, yellow, blue, pink—all sorts of colors, and all sorts of shapes. How soft and smooth and tender they are, too. They would soon wither.

"Run and get some water to put them in, Ella, or they will die," she added.

"What, do you mean to say they are alive?" said Dick.

"Yes, Dick," replied Maude, "all the flowers in the garden are living things. They live and grow in the ground. Let us walk down the garden, and look at some of those living things. Here is one. Do you see anything else on it besides flowers?"

"Oh, yes," said Tom, "there are leaves as well as flowers."

"Of course," she replied; "and you see the leaves on this one are not the same shape as those on the next, although they are all the same color—green. The leaves grow on stalks, and the stalks come from the stem, which springs up out of the ground.

"So, you see, these living things are made up of many parts." As she spoke, she pulled one of them up, and shook it.

"Here is another part," she said, "which we could not see while it was in the ground. It is the root. All things that live and grow in the ground are plants. The garden flowers, the green grass, the crops in the fields, and the great tall trees are all plants. The root holds the plant firmly in the soil. But it does more than that. As the plant is a living thing, it must have food, or it would die. The root finds food in the soil."

REVIEW OF THE LESSON

1. Things which live and grow in the ground are called plants.
2. Plants have many parts, and one part is not at all like another.
3. The root feeds the plant with food, which it gets out of the soil.
4. The root holds the plant firmly in the ground.
5. The stem supports the plant.
6. The leaves grow on stalks.

Courtesy of Country Life in America

A WOODLAND OF WHITE PINE

LESSON X—THROUGH MARSH AND WOODLAND

"We have a good walk before us; we must start out," said the farmer.

So Dick and his cousin Frank followed the farmer, who was Dick's father. Frank never forgot his first walk in the country. At nearly every turn his uncle had something to show him. And it was all so new and strange to this boy, straight from the crowded city where he lived.

Once they came to a place, where the ground was wet. The boys could not walk on it.

"Look out," said Dick, "there is water just under the grass here. Your feet will sink in."

"Ah, this is not really grass," said his father. "It is much too coarse for grass. We call it sedge, and it always grows on these marsh-lands or bogs. The stalks of the sedge, you see, are thick. There is more stalk than leaf. The cattle would not eat this."

"But you told us that the best grass grows in the meadow, as the soil is moist there," said Frank.

"Yes, my lad, but you may have too much of a good thing," said the farmer. "Grass wants some moisture in the soil. Good grass will not grow in dry soil. But no grass of any kind would grow in this wet swampy land.

"One of these days you will see the men laying down drain-pipes in the ground. They are to drain off the water from my fields. If I let the rain-water settle in the soil, the land would get wet and sloppy like this. Then neither grain nor grass would grow in it."

"May we go into the woods now, father?" said Dick. "I know Frank wants to go."

Of course they went, and Frank thought he had never seen anything so lovely.

"Look," said Dick. "The trees in the wood grow tall, but they do not spread out wide. I wonder why that is."

"Well, you see," said his father, "in many parts of the wood the trees are so close together that there is not room for another one to grow. There is no room for them to spread out. They grow tall instead."

"But why do they grow so tall, father?" asked Dick.

"Because plants cannot live without plenty of sunshine and air," he replied. "Each tree tries to lift its head above the others into the sunshine. Do you know what use we make of the trunks of trees?"

"They are sawed up into planks of wood or timber," said Dick.

"Which trunks give the best timber?"

"Those that are straight, thick, and tall," said Dick.

"Right," said his father. "We grow trees in a wood, because they grow taller there, and make the best trunks."

REVIEW OF THE LESSON

1. Marsh-land is wet, swampy soil.
2. Rushes and sedge grow there; but no grass for pasture.
3. Woodland is land covered with trees.
4. Trees grow tall and straight in a wood.
5. They grow tall, because they are all trying to lift up their heads above the rest, to get into the sunshine.
6. These trees give the best timber.

LESSON XI—SOMETHING ABOUT MILK

Milking-time was another great treat for Frank. The cows were driven home from the fields to the farm-yard morning and evening, to be milked.

When he first saw them coming in, he asked Maude what it all meant.

She pointed to the great swollen udders of the cows. "The udder is big, because it is full of milk," she said. "If the cows were not milked at the proper time, they would be in great pain.

"Do you see how quietly they stand while the milking goes on?" she added. "When it is all over they feel easy. The cow-boy will then drive them back to the pasture. But he will bring them in again toward evening, for they must be milked twice a day."

Day by day after that, Frank was sure to be seen in the farm-yard about milking-time. Perhaps he was looking out for the glass of rich warm new milk, which was always given to him.

One day Maude sent Frank to the dairy for a glass of milk. He thought she wanted it to drink.

"No," said Maude; "you may drink the milk by and by if you like. But we are going to have a chat about it first."

So Frank ran off to fetch his two cousins, and they all sat down together.

FISHING

"Now," said Maude, "look at the milk. What is the first thing you notice?"

"It is a liquid," said Tom. "It flows about like water."

"What color is it?" she asked again.

"White," they all cried out.

"Is the water in this other tumbler white, too?"

"No," said Dick; "water is not the same color as milk."

"Then what color is it?"

This was a puzzle. They could see the milk was white sure enough, but they could not tell the color of the water.

Just then Maude made some of the water red, green, blue, and black. It was very easy. She only had to drop a little color into the water each time.

"There," she said, "I can change the water into all sorts of colors. But real water has no color at all."

Then she held up a penny behind the glass of milk.

"Can you see this penny?" she asked.

"No," said Dick, "we can see it through the water, but not through the milk."

"Right. We cannot see through milk; "we say milk is an opaque liquid."

She next showed them a glass of milk that had been standing. There was a thick cream floating on the top of it.

"Now," she went on, "let us find out what this cream is."

She poured a little milk on a sheet of clean white paper, and some water on another sheet. Then she held both sheets before the fire to dry. The milk left a greasy stain, but there was no stain from the water on the other paper.

"Milk, you see, is a fatty or greasy liquid," she said. "If your eyes were sharp enough to see, we should find that the milk is full of tiny balls of fat. These balls of fat are lighter than the rest of the milk. That is why they rise to the top. They form the cream.

"See, I can skim the cream off the top of the milk with the spoon."

REVIEW OF THE LESSON

1. Milk is a white opaque liquid.
2. Everything we cannot see through is opaque.
3. Milk is full of tiny balls of fat.
4. These balls of fat are lighter than the rest of the milk.
5. They rise to the top and form cream.

LESSON XII—BEES

"I do like to listen to the bees humming round us, as we sit in the garden," said Frank. "Do n't you, Maude?

"But, I say," he added, "do those little things make all the nice honey which we eat on our bread? And can they do it all, without any one to help them?"

"Ah, I see," said Maude, "you want me to talk to you about the bees. Well, find the boys, and we 'll have a chat.

"Let me see," she said, as they all sat down under a tree, "where shall I begin? Suppose I begin with the bee itself. The bee is an insect. This means that its body looks as if it were cut through in two places. The word 'insect' means 'cut into.'

"It has two pairs of very thin wings, and six legs, three on each side. But the strangest part of the bee is its long tongue. It is covered with hairs like a brush. The bee can push it down to the very bottom of the flowers."

"But why does it want to do that, Maude?" asked Frank.

"Because at the bottom of most flowers there is a tiny drop of sweet juice," said his cousin. "The bee sucks up this sweet juice with its long tongue, and it goes down into a little bag in its inside, which we call the honey-bag.

"The bee visits flower after flower, and sucks up the sweet juice, till the bag is quite full of honey. Then it flies away to the hive to store it."

"Oh, now I see it all," said Dick. "The honey is in the flowers, and the bees go round and gather it."

"Yes, but bees get something else from the flowers besides honey," she went on. "As they push themselves in to reach the honey, they get covered with fine yellow dust from the inside of the flower. They carry this home, as well as the honey. They use it to make food for their young ones. We call it bee-bread."

"What clever little things they must be, Maude," said Frank.

"They are indeed," she replied, "and they work very hard, too."

"I wish I could have a peep inside one of the hives," said Dick.

"Well, as you can't do that," said Maude. "I will tell you about it. Thousands of bees live together in one hive, and all have their work to do.

"As soon as they settle in the hive, they commence to build row after row of little boxes, or cells. These cells are to hold the honey, which the other bees bring home. When the cells are built, they form a number of walls side by side. We call these walls of cells the honey-comb. They always build their cells the same shape, with six sides. They build them with wax, which they make from the food they have eaten. And they close up the cells with wax, when they are full of honey."

"Why do they store the honey up in that way?" asked Frank.

"Well, they seem to know there will be no flowers in winter," said Maude. "They store honey all the summer to last them till the flowers come again. They are wise as well as clever, you see."

REVIEW OF THE LESSON

1. There is honey in the bottom of most flowers.
2. The bee sucks up this honey with its long tongue.
3. The yellow dust in the flowers mixed with honey makes bee-bread to feed the young bees.
4. Thousands of bees live together in the hive.
5. They build their honey-combs in the hive with wax.
6. They make walls of little cells or boxes side by side, to hold the honey.
7. They store honey in the summer to keep them alive during the winter.

LESSON XIII—MORE ABOUT BEES

"SHALL we have another chat about the bees to-day, boys?" asked Maude.

"Oh, yes, I love the busy bees," said Tom. "So do I," said the other boys.

"Yes, but they do n't all deserve that name," she said. "Some of them are big, heavy, and lazy. They want the others to work for them. Those are the male bees or drones. They spend a roving life all the summer, living on the honey which the workers gather. But before winter comes, the other bees set upon them, and sting them to death. They won't let them live in idleness on the food they have worked hard to get.

"The busy bees, or workers, gather the honey and build the cells. Then there is in every hive one bee, which is the mother of all the rest. She is the Queen Bee. She never leaves the hive to get honey, for she cannot fly far. The other bees pay her great respect. They do whatever she wishes, and go wherever she goes.

"The queen, as the mother of all the rest, lays thousands of eggs from day to day. Some of the cells are set apart as nests to hold the queen's eggs."

"Yes, but how do all the young bees find room in the hive?" asked Frank.

"That is just what I thought you would ask," said Maude. "I will tell you. Among the thousands of young bees, that come from the eggs, there is almost sure to be another queen hatched. That means, of course, two queen bees in the same hive—two queens in the same country. That could never last long.

"One of them must leave. So out that one goes, and a large number of the other bees go with her. They follow her wherever she goes, to find a new home.

"The queen bee has small wings, she cannot fly far. So she soon settles on a branch of a tree. The other bees will not leave her. They swarm round her in thousands. They look like an immense bunch of grapes, as they hang there.

"Then the bee-keeper catches them. He puts a new hive, with some syrup or honey in it, just below them, and gently shakes the branch. The swarm quietly drop down, and make their way into the hive, to get to the syrup. If the queen is with them, they will stay there, and the man can take the hive home with them in. But if not, they will fly away, find her, and swarm again.

"You must not go too near the bees when they are swarming. They sometimes get angry, and then they sting. The man himself has to be careful."

REVIEW OF THE LESSON

1. There are three kinds of bees in the hive—the Queen, the Drones and the Workers.
2. The Drones are lazy; they do no work.
3. The Workers build the cells and gather honey.
4. The Queen is the mother of all. She lays eggs in some of the cells. There must be only one queen in a hive.
5. When the eggs are hatched, there is sure to be another queen among the young bees.
6. When a queen bee leaves the hive large numbers of the others follow her.
7. They swarm round her wherever she goes.
8. They form a new hive.

LESSON XIV—A LUMP OF COAL

"Draw your chairs round the table," said Maude. "We will have a talk about this lump of coal. Shall we?"

"Now," she began, "take the coal in your hands, Frank, and see what you can learn by looking at it."

"It is like a lump of smooth, shiny, hard, black stone," said Frank. "It feels heavy, too," he added, "and the blackness does not come off on our hands. Look."

"Right. Now hit the coal with this hammer, and you will see that it easily breaks up into pieces," said Maude.

"So it does," said Dick; "it must be brittle as well as hard."

"It is," said his sister. "Now, Tom, you shall hold a piece of the coal in the flame of the lamp with the tongs."

Tom did so, and they all watched what took place. The coal did not burn. "The coal will burn, though, if put on burning wood. We cannot make it light with a lamp flame or a match," said Maude.

"Do n't we get coal out of the ground, Maude?" asked Dick.

"Yes. But why do you ask?"

"Because coal must be a mineral, like stone, chalk, clay, and things of that sort," said Dick. "But none of those things burn. I can't make it out."

"Ah, it is true we dig coal out of the ground now," said his sister. "But for all that, coal is not a mineral, in the same sense as stone, chalk, and clay.

"Coal was not always in the ground, as they have been. It was made in a very strange way from trees and plants, that grew thousands of years ago.

"Here is a picture of one of the forests, that grew on the earth in those old times. These forests sank down, and got buried in the ground. Since then they have been changed, from wood and leaves, roots and branches, into this new kind of stuff, which we call coal. You can see the marks of those old leaves still on this piece of coal."

"Ah, now I can see it all," said Tom. "It is the plant matter in the coal that makes it such a good thing to burn. The minerals, which we dig out of the ground, will not burn; but coal is not really a mineral after all."

REVIEW OF THE LESSON

1. Coal is a black, shiny, hard, brittle substance.
2. It burns and throws out great heat; we use it for fuel.
3. Coal is dug out of the earth. It was formed from trees and other plants which once grew in the ground. It is not a mineral.

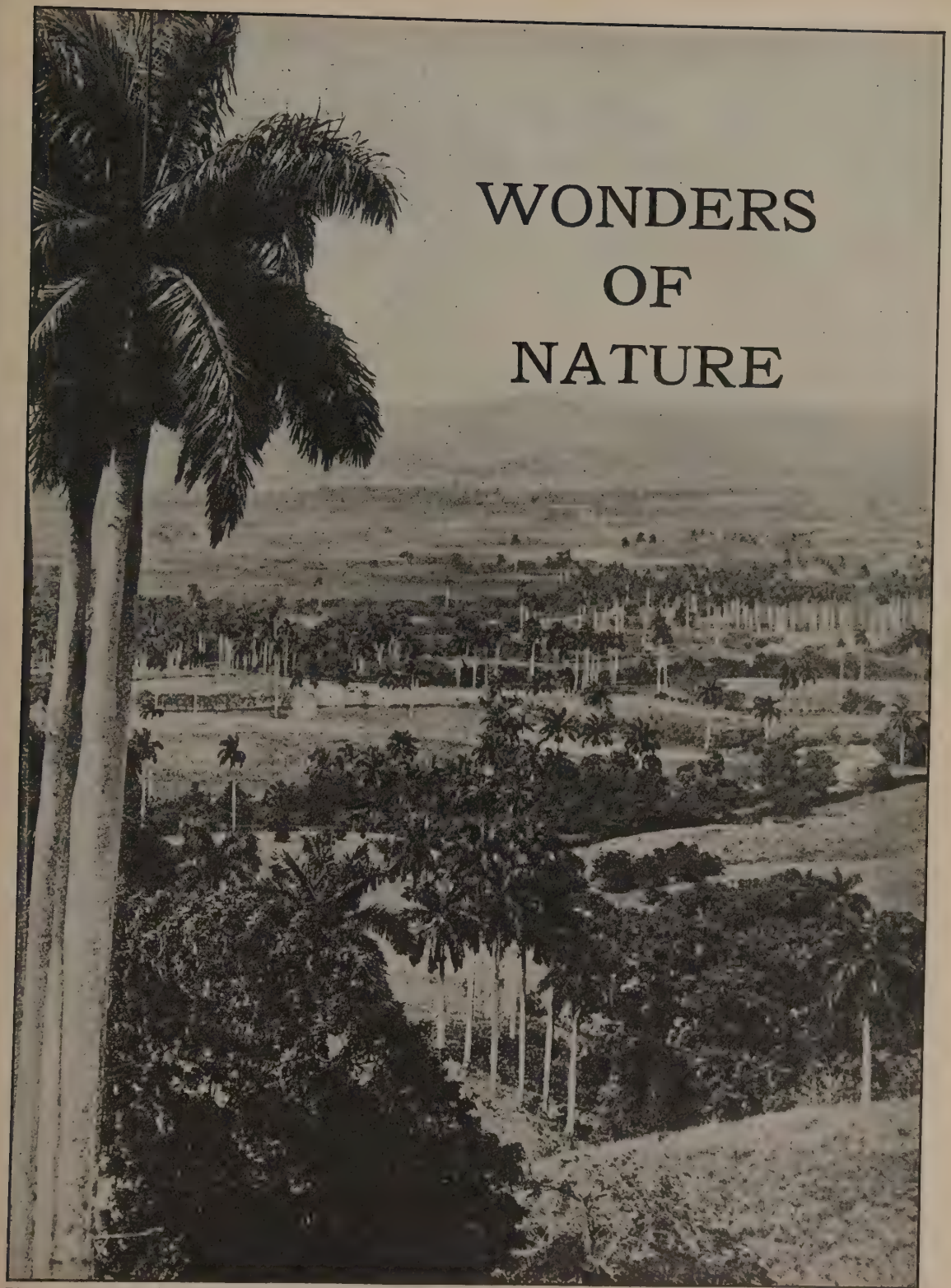


Photo by Hamburg-American Line

CUBA

GREAT RIVERS

BY EHRMA G. FILER

WHAT is the greatest river in the world? Ask a Russian and he will answer, the Volga. A German would say that the Rhine is the greatest, for it is interwoven with the legend and song of his country. The English love the Thames, and the French praise the Rhone and Seine, while all good Americans know that there is only one really great river, the Mississippi, and the Canadian is equally emphatic about the St. Lawrence. So we may say that each nation is partial to its own waterway, and considers no other equal to it. That is only natural, for a country's river is closely bound into the history of the land, and it has a tight hold on the fortunes of the men living on its banks.

Each river has its own peculiar setting and characteristics, which set it off by itself and make it individual. The stories and history suggested to the traveler are more than interesting. Let us imagine that we are travelers for a little while, and we will make a hurried journey to some of the most famous rivers and see what are the most attractive features of each.

THE MISSISSIPPI

To us the most interesting river is the Mississippi, the "Father of Waters." In its majestic course toward the Gulf of Mexico, this river flows through a land which is the cradle of a mighty race, and it has woven its name into the romance, song and story of the land, until it may be called the Great River of America.

The Mississippi has been under the rule of four flags. The Spanish first claimed it, for De Soto, in 1541, was the first to see the main stream. Beginning at the upper course of the river the French slowly fought their way downward. The names of a long procession of Frenchmen, Champlain, Nicolette, Joliet, Marquette, are associated with the exploration of this mysterious stream, of which the Indians had talked so much. With the coming of La Salle the entire river was traversed and then adopted in the name of France, though formally only the upper part was theirs. In 1762 England was in possession of the eastern bank, of the southern end of the river. Then the Spaniards held the west bank, with New Orleans as their capital.

A new nation, in an entirely unlooked for manner, stepped in and made the English and Spanish possession of short duration. The United States, in 1803, bought the "Louisiana Purchase" from Napoleon and secured the whole western territory, thus bringing the rule of the Mississippi forever after under the greatest republic of the world.

The true Mississippi has its beginning in Lake Itasca, "True Source," Minnesota. The upper river winds peacefully through a region of a

THE HUDSON RIVER FROM HARRIMAN PARK ON THE PALISADES

These two steamers are but a small fraction of the total number of boats which carry excursionists up and down this famous river during the part of the year when the river is free of ice.

THE NILE AT EVENING

thousand lakes for a distance of five hundred and thirty miles. From its source to St. Paul the river falls six hundred and fifty-seven feet, and rapids and cataracts are found in some wooded sections. Below this city there is smooth water down to the sea. The river threads its ever widening way through a picturesque country whose history is closely interlaced with the romantic legends and adventures of the early French explorers, "over Hennepin's route, to the mouth of the Illinois, over Marquette's route and La Salle's route, below the Illinois, and past the mouth of the Missouri." Beyond the mouth of the Ohio the Mississippi flows through rich lowlands which it overflows and enriches each year. From Cairo to the Gulf is a winding, crooked stream, over a thousand miles in length. In Arkansas, Mississippi, and Louisiana the river passes quaint old towns, Napoleon, Natchez, Baton Rogue, and at last the Crescent City, New Orleans. From this city of ancient fame it is over a hundred miles to the Gulf. At the mouth of the river are placed the Eads jetties which narrow the stream so that the channel is kept deep and clean.

For over half a century the Mississippi was the one national highway of North America. Very crude flatboats and rafts were the first boats, after the Indians' birch-bark canoe, to navigate this water-road. The lower Mississippi is a deep, dangerous stream, and it was no easy task to float surplus produce to market on these light boats; but the type of boat gradually changed from raft, skiff and flatboat to the large, well equipped river steamers of the early seventies. There were many exciting races between these swift ships from port to port. To-day the railroads have replaced the river traffic to a great extent and only local traffic by boat and coal barges is common.

Great sums have been spent by Congress to improve the channel and build necessary levees or earthen embankments. The levee system has never proved itself absolutely complete, for the river cunningly undermines the weak places in these walls of dirt, and the result is thousands of miles of submerged land. Nothing is more terrible than to live behind this mighty stream in flood season. The yellow waters are heaped up twelve to fifteen feet above the level of the surrounding country and it is held in its natural course only by the levees of dirt. Crawfish and other fish burrow through the levees and often cause disaster.

Five of the cities found upon the banks of the Mississippi are among the largest in population and wealth in the country. These are St. Paul and Minneapolis, St. Louis, Memphis and New Orleans. Many old river towns are scattered between these leading cities. Some of them still boast of many seventeenth century buildings.

In the literature of the United States the Mississippi is often mentioned and wonderfully described. Longfellow speaks of Hiawatha crossing the Mississippi and stopping on its banks. Mark Twain's "Life on the Mississippi" tells of days spent on this picturesque waterway. George W. Cable, Craddock, and many others have laid the scenes of their stories on the banks of this noble stream.

UNLOADING RICE FROM MISSISSIPPI RIVER BARGES AT NEW ORLEANS

From the upper course of the river, where northern forests and wheat-fields line its banks, to the tropical regions, where the sugar plantations come into view, the Mississippi is a long succession of beautiful, ever changing scenery, with memories of by-gone days and bright pictures of modern life.

TRIBUTARIES OF THE MISSISSIPPI

The four chief tributaries of the Mississippi River are the Missouri, Ohio, Arkansas and Red Rivers. No two rivers which flow into the same stream could be more different than the Ohio and Missouri. The Ohio is a beautiful, clear stream which picks its way between high bluffs, often broken by low bottomland. Its channel is deep and it is navigable for many miles. It is a beautiful and imposing river, well worth the visit of any lover of nature. In contrast, the Missouri is a turbulant, dirty river, whose torrents pour logs and other refuse into the Mississippi. It is the largest of the tributaries.

THE HUDSON

There remains yet one stream in the United States which must at least be mentioned. No article on American rivers is complete without the name of the Hudson. Although smaller in size, the Hudson is to the East what the Mississippi is to the North and the South. It was the route by which the early settlers penetrated the wilds of the new country. Historical spots are common sights along its banks. The Palisades form a noble barrier on the sunset side for miles. Palatial homes and country estates tell of wealth and prosperity, while the great metropolis at its mouth leads the world in population, wealth, and the spirit of progress.

THE YUKON

It seems almost impossible that a river so large should be in the far northland. The Yukon is 2,300 miles long and has two-thirds the flow of the Mississippi. It rises in Canada, flows northwest into Alaska, and through a broad delta empties into Bering Sea.

In its upper course the river moves between high mountains, and in some places its banks become veritable canons. In Alaska it passes through hundreds of miles of level, moss-covered tundras. Through this land it is very wide and shallow. At its mouth the depth of the river is only two or three feet, so the flat boats, which attempt to make their way up the stream, almost wallow in mud. Sea-going steamers do not even try to enter the river.

Dawson, the center of the mining district of the Yukon, is the only settlement of any size along the river. From this town the fall of the river is very rapid, being almost one foot per mile down to the sea. Boats may travel to Dawson only during the short season from late May to early October.

The mystery and spirit of romance which overhangs the Yukon River is interwoven with the

Courtesy of Doubleday, Page & Co.

THE MISSISSIPPI RIVER FROM BARN BLUFF, NEAR RED WING, MINN.

history of the gold-digging region, a wild, free country which seems to cast a spell over man and take a hold upon his heart. From its source to its mouth the Yukon flows through this wild country and the river's beauty and grandeur help to weave "the spell of the Yukon."

AMAZON RIVER

It is very natural to turn from the rivers of North America to those of South America, and immediately the name of the Amazon comes to mind. This river drains 2,500,000 square miles and pours from four to five million cubic feet of water into the Atlantic Ocean per second. Where it enters Brazil it is only three hundred feet above sea level, but has a depth of one hundred and fifty feet. Needless to say, this is the most important river of South America and one of the greatest in the world.

There are several ways to make a trip up the Amazon. If the traveler is in a hurry he had best take an ocean steamer. However, to study the river properly it is better to take a slow river steamer. These steamers burn wood instead of coal, and it is a frequent occurrence to stop the boat to load fuel. The trip through the Brazil territory is similar to a trip on a North American river, except where the dense tropical undergrowth lines the banks of the stream, and reminds us visitors that we are in a foreign land. At Manaos, which is a thousand miles from the mouth of the river, the color of the water changes from a muddy yellow to a deep black. The last stop on the boat is the island town of Iquitos, Peru. This town is only five hundred miles from the Pacific, yet has an eastern outlet through the Amazon. The river rises in the central Peruvian Andes. Falls and rapids are very uncommon on this stream, so it is navigable by light boats close to its source.

The most striking thing in a trip up the Amazon River is the heavy plant growth on both sides. Dense forests cover many miles of the land and are inhabited only by semi-savage tribes. The tapir, panther, jaguar, monkey, and many gorgeously colored, songless birds are found in these tropical jungles. Many parts of this wild country are yet to be explored. The traveler feels that he is in an unknown country and one which is awaiting the touch of civilized man. Some highly productive rubber plantations are situated at various points along the stream.

RIVERS OF THE OLD WORLD

Turning backward in time, the first signs of civilization and the beginning history of the human race were centered around four ancient

rivers: the Nile, Jordan, Tigris, and Euphrates, and it is still a debatable question, whether the Nile or the Euphrates is the oldest in history. All four rivers are mentioned many times in the Bible, and upon the banks of each are many signs of a very ancient civilization. They are in sharp contrast with the modern Mississippi and Amazon.

A trip up the Nile immediately suggests pyramids, tombs of ancient Pharaohs, and reminders of the great Rameses. While these historical reminders are very interesting, there are many other things to be seen on the banks of the Nile. This tawny, yellow flood has poured for centuries through the affairs of men, and has watered and enriched the broad valley which is bounded by monotonous deserts. It is a sluggish, sleepy river 3,766 miles long which empties into the Mediterranean Sea. The river itself is neither beautiful nor attractive, but the scenes which line its banks are an ever changing panorama of beautiful pictures. Farther up the river, great dams have been built to hold back the floods, so that more land may be watered in the dry season.

For a short time forget the history of the Nile and try to see it as it is to-day. From the deck of the boat the banks reveal a mass of beautiful, subtle color. The dark palms show almost black against the horizon. The rich bronze of the skin of the native men, toiling by the riverside, the straight women, carrying dull-colored, graceful water-jugs on their heads, as they move up the banks, are almost the only signs of life. The bare hills beyond the valley hold your attention longest. They are so scarred and worn that they look older than time itself. They are of an ever-changing color which varies with the distance and angle of light. They are sometimes a misty grey, a dull brown, and again, a blurred red. The sand stands out as mounds of pure gold. No trees or shrubs soften the outline of the hills. This bareness adds to the majesty of the river valley. Now and then you pass a crane, standing on one leg in shallow water, and in the distance swinging camels move in single file on the sky-line. Villages appear as a picturesque change from the bare hills and fertile fields. At night the sun sinks in a cloudless sky, and you and your fellow tourists are left afloat on the venerable pre-historic stream, "a river flowing out of the dawn of time."

The Jordan, Tigris, and Euphrates must be mentioned on account of their historical significance. The Jordan River to-day is a muddy, shallow, unattractive stream, which flows into the Dead Sea. In importance it lives only in the memory of man as sacred in the story of Israel

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A TYPICAL VILLAGE ALONG THE NILE

The houses are built of sun-dried bricks, made of mud and straw, just exactly as in the days of the Pharaohs

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LOOKING DOWN THE NILE FROM NILE BRIDGE, CAIRO

and in the life of Christ. The Biblical stories connected with it are well known to all.

The Euphrates, with its tributary the Tigris, was once an important commercial river. To-day it is navigated by ancient rafts and slow-moving flat-boats such as were used two thousand years ago. Along its banks are the remains of an ancient civilization which has been consigned to oblivion. There men dig for defaced tablets and broken relics of a one-time glory. Historically, it is the most important river in the world, and it may be that, when Mesopotamia is once irrigated and made to flourish, its day will come again. The country surrounding this river is supposed to have been the Garden of Eden.

THE RHINE

During the World War the interest of the world was centered upon the territory close to the banks of the Rhine. Near either bank men watched the great struggle, upon the outcome of which the future of many nations depended. Caesar, Frederick Barbarossa, Napoleon, all crossed this stream in triumph, but none of these victorious marches of olden days gave the importance to the river that it has gained in the greatest war this world has ever known.

The Rhine rises in the Alps, flows through Lake Constance, which is in southern Switzerland, and across Europe; it ends in Holland and empties into the North Sea. The first part of the river is very narrow and rapid, and at Schaffhausen it gives three leaps over the rocks and starts on a western course. At Basel it turns sharply to the right and proceeds in a generally northern direction.

From its source to its mouth the Rhine has tales to tell of medieval and modern history. Near Schaffhausen is the Black Forest, with its legends and myths of lawless days. Farther down the stream, at Worms, the story of Luther is brought to mind; at every turn there are objects closely connected with his life. The name of Charlemagne is also connected with this city. Near Bingen the river is wide and lake-like, but it soon narrows again. Below here, beginning with the Mouse Tower, is the romantic, legendary Rhine. This part of the river is rich in stories of knights, maidens, dwarfs, and robbers who lived in or near the castles seen on its banks. Below Oberwesel the rocks of the Lorelei come into view.

When the Rhine reaches Holland it is a broad, rather shallow stream which idles across the lowlands and empties into the sea by means of two outlets. From the mountains of Switzerland to

the lowlands of Holland the Rhine is a beautiful river. Its waters are a deep blue and its banks are lined with romantic castles, lovely hills, and green meadows.

THE DANUBE

The Danube is the greatest river in Europe. It has not been visited as has the Rhine and Thames, because it flows through a remote part of Europe. From its source in Germany to its mouth, which empties into the Black Sea, this great European stream flows by seven countries, and seven large cities of the world are situated on its banks. The Danube unites the East and West, drains the slopes of the German, Bohemian, and Hungarian mountains, and also a good part of the Alps. This majestic stream has been the scene of great wars and great empires, and yet to-day it seems wild and savage in its character.

Throughout Germany the Danube is ice-stained and resembles an Alpine torrent. Like the Mississippi it has more water than it can carry and many times its banks are flooded. In this valley, as far as Passau, German traditions and history mark the river's course. It passes through the region described in the Nibelungenlied, that oldest of German poems.

From Passau to Linz, a distance of about sixty miles, the river flows through a picturesque region where many overhanging cliffs add grandeur to its way. This region abounds in legends and myths concerning the famous old castles which line its banks. One of these is in connection with the castle of Durnstein, where Richard Cœur de Lion was imprisoned by Duke Leopold of Austria after he was captured, by the duke, on his return journey from the Holy Land. It is said that the duke had gypsies come and dance and sing to charm King Richard and lure him to his power. Thus he was ensnared and kept a prisoner for many months.

Wooded slopes, velvet hills, valleys of fertile farm-lands, and quaint farm houses make the banks of the Austrian Danube a panorama of beauty. The scene is never monotonous or dull.

From Vienna to Budapest the course of the Danube is majestic. Beautiful fringed willows are in the foreground, while black interesting forests show behind. In Hungary the Danube flows six hundred miles mostly through forests. The stream has here been crossed by most of the conquering forces of the world. The names of Attila the Hun and the Magyars are stamped upon the memory of the people. As the river makes its way toward the Balkans, even in Hungary, signs of oriental life appear. The Hungarian territory is still wild and barbaric in its appearance.

From Budapest to Belgrade is the only uninteresting part of the stream. The landscape is monotonous as the river flows through Serbia. Many ruined walls are passed which date back to Roman days. By the time the course of the river has passed through Rumania and Bulgaria, Turkish women in oriental costumes come to the boat and sit in oriental fashion on the deck. At Sulina the river flows into the Black Sea. Here it is broad and gray in color, and resembles a lake.

THE THAMES

The Thames cannot compare in size with many of the rivers which have been mentioned, but it is a most beautiful and interesting stream.

To know the Thames thoroughly one must spend days loafing along its banks or paddling up the gentle current. It is a narrow, placid stream which seems made for row-boats, skiffs and pleasure launches. Only below London is there any commercial traffic at all. Above this city only pleasure-seekers paddle their light craft. On any fine day a gala sight is afforded any onlooker. Baskets of lunch and tea-tables seem a very part of the scene. Country inns, tea-rooms, and farm-houses along the way offer refreshments to travelers, who have neglected to bring their own lunch along.

The river is so shallow that locks are necessary to make it at all navigable. Many of these date back to an early period. The boat passes one of these locks on an average of every thirty-five minutes. The greatest length of time between any two is an hour and twenty minutes of moderate travel. The lock-house covered with roses and vines, the pretty garden close by, and the courteous keeper, form a picturesque scene of never-failing interest. The lovely English landscape on both sides of the banks is made up of low rolling hills, green pasture-lands, and quaint houses.

YANGTSE-KIANG

The very name of the Yangtse-kiang tells us that it is a stream that flows through China. From source to mouth the river has many names. At one place it is called by the natives Naan-hwei, farther down it is known as the Ta-kiang, which means great river. From the province of Yang to the sea it is called Yangtse-kiang by the Chinaman. But to foreigners this name means the entire stream, and is interpreted by some to mean "Son of the Ocean."

The river rises 16,000 feet above sea-level in the Tang-la mountains of Tibet. The upper course is swift and dangerous and high mountain cliffs overhang the water. In this part of the river rapids are very common, and the native crafts which navigate the waters above I-chang have to be pulled through these rapids by extra crews of one hundred or more men. The scenery along this part of the river is very wild and very beautiful.

From I-chang to the sea, modern river-steamers handle the traffic. At this point, the river emerges from the mountains, and bends, and curves through a somewhat level, open country. In going from I-chang to Shanghai, the Yangtse-kiang crosses three provinces, and touches the borders of two others.

One noteworthy city, which the river passes, is Hankow, which is China's most famous tea-market. The next city to attract the traveler's attention is Kiukiang. It produces beautiful porcelain, and has several large factories for the manufacture of this ware. The most interesting city along the entire stretch of the river is Nanking, which has twice been the capital of China. It has a wall thirty-five miles long, which encloses cultivated fields as well as the city itself. It is a famous literary city and one of the chief centers of the scholarship of China. While Shanghai is always spoken of in connection with this river, it is not located directly on it, but is situated on a tributary of the Yangtse-kiang, twelve miles above the junction of the two rivers.

After having flowed almost entirely across China, the Yangtse-kiang empties into the Yellow Sea, in a flood of muddy waters, which averages 770,000 cubic feet of water per second. The yellow waters of this river are noticeable thirty miles from shore, and before land is sighted by the incoming steamers.

GREAT WATERFALLS AND CATARACTS

BY EHRMA G. FILER

THERE is something about the beauty and wonder of falling waters that gives to the onlooker a thrill of exultation, a sense of awe, and oftentimes a feeling akin to fear. The beauty of a waterfall has been compared to the beauty of birds, musical, swift of flight, and brilliant in color; or again to exquisite lace, made of invisible threads. Another writer speaks of the demon of a waterfall, which makes the rushing torrents seem alive and inhabited by some offspring of the nether world.

The great waterfalls of the world may be divided into two classes; namely, those famous for the distance down which the water drops,—they are called mountain cataracts; and those famous for the huge amount of water passing over them, rather than for their extreme height. The following table gives the best known waterfalls:

First class, or mountain cataracts:		
Yosemite Falls, California,	2660	feet.
Grand Falls of Labrador,	2000	"
Gavarnie Falls, Pyrenees,	2000	"
Oroco Falls of Monte Rosa,	1400	"
The Staubbach, Switzerland,	1000	"
Class two:		
Victoria Falls of Zambezi, Africa,	400	feet
Iguassu Falls, South America,	200	"
Niagara Falls,	150-164	"

The Kaieteur Falls, in British Guiana, hold the unique place of being the greatest in combined height and flow, having a single leap of 741 feet over which great torrents rush.

Here in the United States we have the highest waterfall in the world. The Yosemite Falls are in the celebrated Yosemite Valley on the western slope of the Sierra Nevada Mountains. The Merced River flows through the valley from east to west. The scenery along this entire river is very picturesque, but the most famous spot is at the Falls, which make three successive leaps in their descent. The Yosemite Falls have been described as "slim as a reed, and tall as a moonbeam, which poises with white feet on earth and wears a crown of blue." The valley and falls were discovered in 1851, and in 1864 the valley surrounding these falls was made a national park, so these wonders are to be guarded for future generations.

A magnificent cataract of the Grand River, in Labrador, covers a distance of twelve miles. These Grand Falls, and the name certainly suits them, drop 760 feet in the twelve miles, and they culminate in a vertical drop over a broad rock, which is two hundred feet wide. The roar of the mighty waters can be heard over twenty miles away, and the sight of the torrents rushing madly, to what appears to be their destruction, is awe-inspiring.

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NIAGARA FALLS BY NIGHT

Illuminated by searchlights, which are a permanent feature

The Grand Falls were first discovered in 1839 by a European, but they were not seen again by a white man for many years. Their existence became almost legendary until in 1891 two separate expeditions happened upon the wonder, two hundred and fifty miles from the sea.

Switzerland is celebrated for its mountainous, picturesque scenery. There is no more wonderful sight in all this beautiful, romantic little country than that afforded by the Staubbach Waterfall. It is in the southern part of the Canton of Bern. The name, Staubbach, means dust-stream, and it was given to the waterfall in an early day by the inhabitants of the country, because long before the stream reaches the bottom of the descent it is blown into a dust-spray.

Gavarnie Falls, in the Pyrenees Mountains, form one of the thirteen cascades which fall into the Cirque de Gavarnie, which is a natural amphitheater nine miles around, and surrounded by three mountain ranges. The Gavarnie Falls are the largest of the thirteen and are fed by the Gave-de-Pau. The nearest town is of the same name.

While these waterfalls, which are celebrated for their height, are very interesting and wonderful, those known for the amount of water flowing over the precipice attract more admiration.

THE IGUASSU FALLS

In South America we find the Iguassu Falls, one of the most famous falls of the second class. The Iguassu River is one thousand miles long, and forms the boundary between Brazil and Argentina. This stream rises only thirty miles from the Atlantic Ocean, but a mountain range prevents it from flowing into the ocean, and it turns westward until it joins the Parana. Twelve miles above the junction of the two rivers the Iguassu makes a right-angle bend and enters a narrow gorge. Here are the falls. The river divides and forms two falls, one on the Brazilian side and one on the Argentine side. The Brazil falls are the greater. In the rainy season the islands between the falls are all covered, except one large one, and the width of the expanse of water is three thousand feet. The word, Iguassu, means Great Waters, and is very appropriate for this mighty torrent. The entire contour of the falls is estimated at from six thousand to ten thousand feet. It is difficult to obtain a view of the complete falls, for the view is broken by the forests. This celebrated spot may be reached in twelve days from Buenos Aires.

To give some idea of the volume of the mighty

LOWER FALLS OF THE YELLOWSTONE

waters which surge over the brink of rock, let us compare it to things we know. The power of this waterfall has been estimated by experts to be equal to fourteen million horse-power. This one waterfall has ten times the power of all the waterfalls in Germany and it is equal to the combined water power of Scandinavia, which is noted for its numerous waterfalls.

NIAGARA FALLS

The Victoria Falls on the Zambezi River, in Africa, are twice the size and have five times the power of Niagara, but many people think that for sheer beauty Niagara reigns supreme among all the great waterfalls of the world. "Niagara is a perfect picture in a natural framework. Every point and line and curve of motionless rock, trembling verdure, and gliding water is a touch of majestic beauty."

Niagara Falls are located between Lake Erie and Lake Ontario. Above the falls Niagara River winds about as any broad, lazy stream might do. As its waters approach the brink of the precipice, you can see the first breakers, where the current feels the draw of the descent, and the water leaps forward as if drawn irresistibly to its fate. Just at the edge of the falls, there is a curious pause. Suddenly the dancing, tossing waters become calm and glassy, as they turn the corner of the ledge and "hurl themselves into a snow-white bulk of noise, mist and mystery underneath."

The color of Niagara's water is perennially green, a wonderful emerald green. This combines with the silver and white of the foamy waves and spray to make a marvelous color-scheme. This coloring is what stamps Niagara Falls as more beautiful than terrible. The lovely rainbows hanging over the noise and clamor render soothing and exquisite even the uproar of the picture. The smaller American Falls are the louder of the two, because they crash in a full impulse of descent upon the huge boulders heaped at their feet.

It is interesting to know that the contour of the falls is three thousand and ten to four thousand seven hundred and seventy feet. The actual drop of the falls at its highest point is one hundred and sixty-seven feet. The estimated flow is fifteen million cubic feet of water a minute. The strength of the falls is three million horse-power.

After seeing Niagara the lovely sight will linger in the memory as a picture of splendid magnificence.

KAIETEUR FALLS

The Kaieteur Falls in British Guiana are remarkable for their height as well as for the volume of water which hurls over the precipice. They are not so well known, nor have they been visited by tourists as often as other celebrated falls. This is due to their being located in a dense forest, far inland, which makes them difficult to reach. They were discovered about fifty years ago. The Essequibo River, on which these falls occur, drains five times the area of the Hudson and is twice as long.

When, after a long journey, the falls are reached, the tourist feels well repaid for the trip by the sight which meets his eye. To reach the falls a small plateau of wet sand-rock must be crossed. This plateau is covered with rare orchids. Suddenly a precipice eight hundred feet high yawns in the plateau and there, five hundred yards away, are the falls. The softness of the monstrous current is very unusual. A smooth, rapid river flows to the brink and turns quietly downward. As it drops a soft white mist rises, and before the water reaches the bottom it is a chaos of seething clouds.

The name comes from the Indian word Kaietuk, which means "the fall of the old man." Legends tell that a certain Indian tribe nearby had an old man, who was of no more use. They put him in a canoe, and let him sweep over the waterfall. As he fell, he turned to stone. There at the bottom of the falls are two boulders, which appear to be the outline of an old man in a canoe.

There are many other waterfalls worthy of more than mention. The Shoshone Falls, called the Niagara of the West, are a magnificent sight in the midst of a silent Idaho desert. Yellowstone Falls, in Yellowstone Park, are in a remarkable setting which gives them a particular distinction. Montmorency Falls, near Quebec, seen from the St. Lawrence River, were very beautiful until they were harnessed to supply Quebec's electricity. Norway and Sweden are known for their marvelous waterfalls, which are too numerous to mention.

Of all the wonders of nature a great waterfall reveals more beauty, strength, and human appeal than any other sight. The mighty waters seem to have a soul, which lies deep in its bosom, and a voice, which laughs or weeps according to man's mood. It is no wonder that the savage worshipped the great waters as a god, for in every great cataract there is something that inspires awe.

VICTORIA FALLS, ZAMBEZI RIVER.—MAIN FALLS FROM RAIN FOREST

IN RAINBOW-LAND

BY AMY SUTHERLAND

Until only a few years ago, the Greatest Wonder of the World lay hidden away in one of the most savage parts of Africa. The natives of that region, terrified by its mysterious columns of vapor and its subterranean thunder, did not venture within many miles of it. The white men who had looked upon it could be counted on the fingers of one hand.

And yet, more than fifty years have passed since the explorer Livingstone, journeying eastward along the Zambezi, first beheld that rainbow mist rise above the forest. Of its cause he could learn nothing from the savages; and so, except for his own conjectures, he came quite unprepared upon his splendid discovery. He approached it by the river, which above the Falls is a mile wide, and below them runs for fifty miles at the bottom of a gorge between four and five hundred feet deep, whose twin walls of black, precipitous rock show for all that distance scarcely a ledge or slope where the smallest plant may cling. So, after a peep downward at the Falls, from the island on their brink which now bears his name, he left his new-found marvel less than half seen, and departed whence he came.

And the loneliness of those vast solitudes brooded once more over forest and river, to be broken only at rare intervals by some wandering hunter, or perhaps by a party of men adventuring through endless toil and danger to behold a wonder whose fame, even then, spread as far as that tiny portion of South Africa where white men dwelt and civilization held sway. So things remained until the day of Cecil Rhodes, under whose auspices went forth the *voortrekkers,* or pioneers, to colonize the vast land now called Rhodesia, in the heart of which the Victoria

Falls lie. Many of these voortrekkers, and their wives and children, died at the hands of the savage Amatabele tribe of natives; but the survivors in the end were victorious, and the country became their own.

Cecil Rhodes died, and was laid in his lonely grave among the Matopo Hills, on a rocky summit which looks far out over the land he loved. But his wishes were remembered, the greatest and the least of them; and still, year by year, the Central African Railway grows, every year a little, northward through the forests. And now it has passed the Zambezi, and over that hitherto unconquerable gorge has been thrown one of the most wonderful railway bridges ever built; and close by has sprung up a great hotel, so that the Victoria Falls and their surroundings are attainable at last by all the world.

For many days the approaching traveler has been flying through a mighty tropical forest, in which a path has been cut for the railway line, but which is otherwise so undisturbed, so vast and silent and lonely, that it is hard to believe white men can ever make a home in it. Here the lion prowls at his own sweet will, and legions of antelopes, great and small, graze on the sweet veldt. And here elephants wander in troops of fifty or more, and in the swamps the hippopotamus plows his way through the papyrus reed and the ten-foot Rhodesian grass. The little iron shanties of the railway men are the only signs of civilized life. The natives of the country are few and far between; their kraals, with the conical huts peculiar to this race of Africans, look down from the rare, slight eminences.

There is no change in the scenery, little to give warning of the wonder that one approaches. Only, above the noise of the train, a far-off murmur of sound grows upon the ear; and a little while later, floating upward from out the forest, there comes in sight a long line of snowy vapor, which, as the low sun touches it, glows with soft, many-colored lights. This mist-cloud is caused by the sudden narrowing of the great Zambezi River in the Chasm, not two hundred yards wide, which receives the Falls at the end of their leap. The cloud rises at times as much as five hundred feet into the air, and there condenses into rain, which falls in eternal showers glorious in this thirsty land, and makes in the country close about the Falls one perpetual spring.

THE MAIN FALLS FROM CATARACT ISLAND

This tract of land is known as the Rain Forest, and in its tropical magnificence, its soft and delicate beauty, can surely be surpassed by nothing on earth. All about the path laboriously cut through its jungles, rise the trunks of splendid

trees, which seem to tower into the very sky; their stems, and the earth about them, are hidden in masses of giant ferns, whose long sprays

THE FIRST ZIGZAG OF THE ZAMBEZI RIVER BELOW VICTORIA FALLS.
From a photograph by Ellerton Fry.

sway and quiver continually under the weight of the falling drops. Strange plants of many kinds grow here; orchids droop from the trees, and palms raise their graceful heads from out the tangle. Through it all drift the rainbow vapors, and from between the trees the sun strikes in long, slanting rays, and lights up the wet vegetation, the rising mist, the falling raindrops, with an effect so tenderly and unutterably lovely that it often brings tears to the eyes.

In places the forest is more open, and here the giant Rhodesian grass grows, twelve feet high, its flower-heads heavy with wet; and palms, free from the jungle and able to grow as they will, rise thirty feet into the air, their every fringed leaf hung with gems.

At any time a few steps will take the traveler from out this Forest of Rainbows, to where he may stand on the very verge of the terrific Chasm. Here he is directly opposite the Falls, which come rushing over the further tip in a mass of foam as white as snow, to fall with a roar more than four hundred feet into the dreadful abyss. By leaning over, it is possible at times to see the river at the bottom, a boiling, turbulent torrent racing furiously to the right along its rock-bound bed; but more often all is hidden in the mist, which is hurled upward so densely that in places the Chasm seems choked with it, and it rushes past the observer with an audible sound and a suggestion of irresistible force, awe-inspiring to a degree. Opposite the Main Falls, a spot known to the natives as Shongwe, the Caldron, it is so heavy as to blot out sky, forest, and even the Falls themselves, and we are in a strange twilight, half smothered in vapors and wholly deafened with the thunderous roar of the Falls so close at hand.

Everywhere are double rainbows of surpassing brightness, sometimes arches, sometimes complete, glowing circles. They are so close, one the stern black cliffs; and tiny rainbows by hundreds dance in the falling sheets of water and among the palms and ferns of the forest.

VICTORIA FALLS, TAKEN FROM A POINT JUST OPPOSITE THE EXIT FROM THE CHASM
From a photograph by L. Pedrotti.

may watch their melting colors as in a soap-bubble; and they move and change continually with the sun or the movements of the spectator. They gleam softly in the cloud, brilliantly against

A strange circumstance cannot fail to strike the observer, and awe him, as perhaps nothing else could, with a sense of the vast depth of the fissure into which he fearfully gazes. The

spray and rain bring into being hundreds of streams, which flash over the edge of the cliff opposite the Falls in an eternal effort to rejoin their parent river. But they never reach the bottom. Long before they are half-way down, they vanish, dissipated once more into spray, and borne upward in the form of lighted mist.

Of the radiant beauty of the whole scene, one writer, a traveler of renown, says:

"I believe that on that day I was gazing at the most perfectly beautiful spectacle of all this beautiful world.

"As the sun's rays fell on that kaleidoscopic, ever-moving, changing scene, made up of rock, water, mist, and shivering foliage, the coloring of it all was gorgeous, yet of sweetly tender tints under that luminous, pearly atmosphere formed by the spray-mist. Below, where one caught glimpses of the rushing water, it was turned brown and golden, blue and rich dark green. The cliff, sparkling with dripping water, was of shining black and glowing bronze. The foliage of the Rain Forest was of the green of an eternal spring, and a myriad jewels of twinkling light were made by the water-drops on the trembling leaves. A glorious rainbow spanned the Chasm, and other rainbows flitted in the haze. As for the tender, pale beauty of the Cataract and of the luminous, pearly mist, no words could convey it to the imagination."

Another writer says: "The beauty of the pearl-tinted atmosphere, and the glory of the dazzling rainbows, are the first and the last impressions that the Victoria Falls give to the mind."

The eastern extremity of the cliff opposite the Falls is known as Danger Point; and here the Chasm turns abruptly at right angles, and becomes the famous Gorge which for fifty miles zigzags across country, with the Zambezi like a silver cord at the bottom of it. Just at the turning-point, a mass of rock has fallen from the cliff and lies below in the river—a mass which, it is interesting to note, Livingstone describes as just *ready to fall*, and which in his drawing of the scene is represented as almost parted from the rest. Along the Gorge a strong, cold wind blows always, and bears the mist as far as the railway bridge and the exquisite palm groves near it.

Above the Falls, the scene is scarcely less fair. Here lies the broad Zambezi, placid and calm under its sunny skies, with its fifty islands, palm-crowned, wonderful, kept ever green and spring-like by the soft spray-showers. On the banks grows the burly baobab, whose trunk is as large as a house; lovely forest fringes either shore, and gay-plumaged birds flit among the flowering trees and feast on the plentiful wild fruits. From here the mists of Victoria take the form of five towering pillars, bending with the wind, white below, but dark farther up, where they condense into rain. Livingstone says of the river at this point: "No one can imagine the beauty of the view from anything witnessed elsewhere. It had never been seen before by European eyes; but scenes so lovely must have been gazed upon by angels in their flight."

The monstrous footprints of the hippopotami are thick along the banks, and crocodiles lie sunning themselves in the open spaces. Tiny gray monkeys, with wise black faces, swing from the miles of creeper which festoon the trees. Green parrots shriek, and strange great reptiles crash a path through the tangle. The savage natives punt or paddle their dugouts on the placid bosom of the river. So recent is the white man's advent that the whole is scarcely changed from the day when David Livingstone first looked upon it and realized, with beating heart, the Wonder he had found.

THE EDGE OF VICTORIA FALLS, AS SEEN FROM A DISTANCE
From a photograph by L. Pedrotti

GREAT CAVES AND NATURAL BRIDGES

BY EHRMA G. FILER

EVERY boy who has been fortunate enough to be able to play in a cave on some river-bank, and who has imagined that he was a second Tom Sawyer with his playmate, Huckleberry Finn, knows the feeling of mystery and excitement which these underground houses produce. Just in the same way, man's interest and curiosity have been aroused in the exploration and study of the great caves of the world.

In early days, legend and fable enshrouded the caves of the old world. At various times in history, caves have been used as places of shelter, places of refuge, places of worship, and as tombs in which to bury the dead. In the days of ancient Rome, nymphs and sybils were supposed to live in caves, while in some more modern countries the caves were believed to be inhabited by fairies and dwarfs. The gods, Pan, Zeus, Pluto, and others, were worshipped at altars, placed in shadowy cave-temples. The great oracles of Greece were always located in or near a large crack deep in a cavern. In the Bible, there are many references to people using the caves of Judea and Egypt as dwelling-places.

When some of the early superstition which surrounded the caves of the world was cleared away, and all fable and legend had the clear eye of reason applied to them, caves were found to be just the result of natural forces working deep in the earth's bosom, the same natural forces which are common on the face of the earth. All caves belong to one of three classes, namely: those formed by force of waves or currents; those formed in volcanic regions; and those cut from rocks by the action of carbon dioxide and rain-water, together with the action of sand and stones, kept in motion by streams which have flowed over them for centuries. This last class is most important, and we in fact find many caves of this type.

THE MAMMOTH CAVE

The largest and best-known cave in the world is the Mammoth Cave of Kentucky. It is located about eighty-five miles from the city of Louisville, and in a section of Kentucky which is rich in limestone, and which is known for its grottos, its caves and holes in the earth. The formation of Mammoth Cave was due to rain-water that seeped through limestone rock and formed tiny rivulets, which finally became the underground stream, now called Echo River. The cave is estimated to be about a million years old.

At the foot of a high bluff, in the midst of picturesque trees, and surrounded by lacey ferns and mosses, is the natural arch which forms the entrance to the cave. Descending a winding stairway of seventy stone steps, the visitor faces an iron doorway which is opened by the guide. Within the cave there is a maze of narrow passageways, vaulted halls with huge domes, deep abysses, broad avenues, rivers, lakes and cataracts.

The first room which is entered is the rotunda. Passing from this room the visitor approaches the Grand Gallery, which has a ceiling eighty feet high. Here is found the Giant's Coffin, a huge rock forty feet long, twenty feet wide and eight feet deep, the shape of which suggests vividly the huge giant who should be lying within. From this gallery the visitor may take any of the four routes which the guides have mapped out.

It would take a book to describe all the beautiful rooms and hallways of this huge underground palace. Some of the best-known and most interesting places are the Bottomless Pit, Revelers' Hall, Cleveland Avenue, the Bridal Altar, and the room whose ceiling and walls appear to be covered with stars when any chemical light is thrown upon them. Several years ago the Bottomless Pit was proved not to be so terrible, and now a bridge spans this deep abyss, and leads to a new part of the cave. Revelers' Hall is a hugh banquet-room, where the visitor may sit and have the novel experience of being served with food in an enormous place, suggestive of an old medieval banquet hall, where one thousand people might easily be seated. The walls of Cleveland Avenue glisten and appear to be covered with thousands of jeweled roses, chrysanthemums and other beauties from a florist's shop.

The underground rivers with the blind fish, some of which are very rare specimens, swimming around in them, give the visitor an uncanny feeling. Echo River, River Styx and Lake Lethe are all that their names suggest. A visitor might spend days in Mammoth Cave and then not see all its marvels. This wonder of Mother Nature holds man's interest and strongly appeals to him as a scientific study.

VICTORIA FALLS BRIDGE

FINGAL'S CAVE

Another well known cave is Fingal's Cave on the Scottish Isle of Staffa. This cave has been known for a long time and there are many references to it in literature. The name of Fingal's Cave is quite recent; the Gaelic name was Uaimh Binn, the musical cave. The name was probably suggested by the echo of the waves between the empty walls.

The formation of this cave is very different from that of Mammoth Cave. It is one huge room opening off the sea on the rocky coast of the island. Its arched roof appears to be supported by huge basalt columns, many of which are broken off several feet above the water's surface, and resemble old pier supports. There is a uniform breadth from the opening to the end of the cave which is 227 feet long. It is 42 feet wide and 88 feet from the top of the arch to the rocky bottom.

There is much scientific discussion as to whether this cave is a natural one or whether it was made by the hand of man long centuries ago. If natural it has been made by the waves of the sea beating upon the rocks, and hollowing out the open space. Several well-known authorities contend that this would be impossible and give very good reasons for their belief. They attempt to connect the history of the cave with the island of Iona, which is a short distance away. Be that as it may, the cave is there, and a very interesting one it is.

OTHER CAVES OF INTEREST

Luray Cave in Virginia is the scene of a wonderful experiment. The cave itself is similar to Mammoth Cave but on a much smaller scale. A Sanitarium is built over the cave, the air of which is cooled or warmed by air from the cave. The temperature of this air is 54 degrees Fahrenheit, summer and winter. Here throat and lung troubles are treated and with wonderful success.

Wyandotte Cave is second in size among the world's caverns. It is also similar to the Kentucky wonder but not so well known. In Asia Minor and other countries of the old world there are many small caves which have played important parts in history.

ICE CAVES

The ice caves in the northland, or on snow-clad mountain peaks, are very unusual and wonderful, and the beauties inside the frozen palaces in the huge hollow blocks of ice are beyond description. The largest ice cave in the world is in the Dachstein Mountains. It is six thousand five hundred feet long. Within the cave there is always an icy wind blowing. The gigantic ice-pillars and other ice formations are fairylike in their seeming unreality.

Caves will never cease to claim man's attention and also his time in attempting to understand and fathom their mysteries. The skeletons of men, their weapons, and other relics have often been discovered in caves. These things have taught the world much of the people who inhabited the earth ages ago. If the stone images and objects formed so peculiarly in these underground realms could be inspired with life, what tales might they not tell of human hopes, and fears of centuries past, which have long since been forgotten, and buried in the depths of the earth!

NATURAL BRIDGES

Natural bridges have a close connection with caves, for they are formed in much the same way. A natural bridge is any formation of rock, or earth, which spans an opening and which was formed by such natural causes as stream-erosion or wave-action.

There are over fifty natural bridges in the United States and they are all of considerable size. This formation seems peculiar to this country, for few are found elsewhere, and the Pont d'Arc, in France, which has a height of 197 feet, and a span of 213 feet, is the only one of any size in foreign countries. Natural bridges are found in New England, in Virginia, in Kentucky, and throughout the Rocky Mountain region.

In a remote and untraveled part of southeastern Utah is the largest and most remarkable bridge, that has yet been discovered. It was first seen by white men in 1910, but in all probability the bridge was known to the Indians long before. It has been learned from an old Navaho Indian that this arch is supposed to be the sun-path or rainbow. There is a superstition regarding it, that everyone who passes under its lofty curve must say a certain prayer on returning, or bad luck will follow him the rest of his days. There are the remains of an ancient altar almost directly underneath the arch, which goes to prove that the Indians frequented the place at some early period.

This arch is carved from fine buff-colored sandstone; it is brick-red in color, although stained in places with streaks of a darker shade. To give an idea of its size, it has been said that this arch could easily span the dome of the Capitol at Washington. It is 309 feet high and has a reach

of 278 feet. The curve is of wonderful symmetry and it rises in graceful lines, and reaches from one boulder to the other. The Indians call it Barohoini, the Rainbow Arch, and that translation is the name given to it by the white man to-day.

The Rainbow Bridge was formed by stream erosion. After a small hole was made through the solid rock the action of the water, with the added help of weathering, enlarged the opening and gave the rock its present shape. This entire region is very mountainous and many mountain streams and cañons are found. The setting seems perfect for just such a work of nature.

In 1911 the Government made this a national monument, so that this natural wonder would be preserved for the enjoyment of all and kept from any commercial use.

The Natural Bridge in Rockbridge, Virginia, is perhaps the best known, and is the most frequently visited by the casual traveler. A picture of it is usually shown in school geographies and other text-books. The arch of the bridge is 250 feet above the stream, which has caused this formation. It has a span of 90 feet. This natural bridge takes the place of any iron or wooden structure, for it is the means of passageway over the stream and is part of a public road.

In Alabama there is an arch of sandstone which is so unusually thin and flat and of such perfect proportions that it appears to be the work of man, and not the chance result of nature's labors. The one natural bridge in the United States which is formed by wave-erosion is in Santa Cruz County, California.

DESERTS AND PLATEAUS

BY EHRMA G. FILER

Most of us who have never seen a desert imagine that it is a vast sandy region with intense heat, and that all deserts are alike. While indeed all such regions are barren of much plant and animal life, yet the surfaces of deserts differ greatly, and they offer many dissimilar sights. Huge rocks, sculptured by the winds into fantastic shapes, sand dunes, violent storms, cloudless skies with beautiful sunsets, and peculiar vegetation are some of the varied characteristics of desert areas.

The tourist should know his own land first, so let us see what deserts in North America are interesting before turning to those of foreign countries.

DESERTS OF NORTH AMERICA

In Arizona we find what has been called the greenest of deserts. While it is an arid, dry region, which supports no profitable plant life, yet from a distance the stretches of country appear green and prosperous. This is due largely to numerous creosote plants and stubby mesquite trees which grow every few yards. In most desert regions there is a short rainy season, and then intense drought the rest of the year. In the Arizona desert, besides this rainy season, there are southern winds which bring moisture and make possible this green appearance of the country. Yet the land itself appears to have been dry for centuries.

A species of the wrinkled, ancient-looking cactus, peculiar to American deserts, is a common sight. This plant is the best example of Nature's adapting herself to conditions. The lack of moisture is overcome by the plant's developing huge, thick leaves, which give off very little moisture, and store what they have for future use. In springtime this desert is really a beautiful place, for the creosote plant and mesquite trees have bright yellow blossoms, which add color and life to the rather drab scene. Nomadic, winding roads lead across this desert. The appearance and customs of the few people whom you meet suggest that we are in Mexico. The very climate reminds you of the tropical climate of some parts of Mexico.

In California we find a desert that is fast becoming a pleasure resort. People first began going there that they might recover their health, but now many go simply to enjoy the scenery and to take a vacation.

This desert area is at the base of San Jacinto Mountain, and it covers quite a stretch of country. It is bounded by high mountains, which offer interesting climbing and trails to the traveler. The intense sunshine, the purity of the morning air, and the cloudless, starry nights make it a wonderful place for an outdoor camp. The shifting, indistinct colors of the surrounding country cast a spell over the weary visitor, and he never tires of studying and watching them.

At the very foot of San Jacinto is a palm garden which is famous for its fan-palms. Every

one should take a trip to this forest of lacey, spreading palm trees. The under branches are high enough for a man on horse-back to ride beneath them. The wind makes soft music in the upper branches, and this adds to the unreality of the scene.

Very different from these small deserts of North America are the huge arid regions of Asia, Africa and Australia. Central Australia is one vast desert. South Africa has the large Kalahari Desert, between the Zambezi and Orange Rivers. A great arid region spreads across Northern Africa to the Red Sea and then it is continued through Arabia, Persia, Turkestan, and almost to the Pacific Ocean on the coast of Asia.

THE SAHARA DESERT

The Sahara Desert is typical of most of these arid lands, and in studying it we shall learn the chief features of the other deserts. The Sahara is the part of that great arid belt which is located in northern Africa. It is composed of a series of elevated plains, which rise in terrace-formation to a height of several thousand feet. There are many long sandy stretches with only sand dunes to break the stretches of level land. Other parts of the desert have many boulders and rocks scattered about and sand is not found. Such areas have stratified rock close to the surface. The process of weathering has carved many of these boulders into queer and fantastic shapes.

In the Souf region of the Sahara the characteristic sights are the giant sand dunes, which are a dusky yellow in color, the occasional glimpse of wandering Arabs, and the many sunken gardens which are found here and there. At night the shadows cast by the sand dunes are of enormous size and give an unearthly appearance to the lonely, silent desert. The sunken gardens are fertile regions where date-palms flourish. They differ from the average oasis in that no flowing water or spring is visible. However, moisture is close to the surface. The date-palms are placed quite a distance apart and the ground looks dry and sandy between them. The white-clad workmen have much to do to protect their gardens from the desert storms.

A desert storm is a fearful thing. Whirlwinds often accompany the hurricane. Many people have been killed by these storms, and sometimes whole caravans have been buried. The wind usually rushes along, driving sand before it. So thick is this cloud of sand which is borne by the wind that the darkness of night is often caused at noon. The sand heaps up in huge waves and covers everything in its path. Great suffering to man and animals is often the result. The Simoon, which means "poison wind," is the most terrible form of desert storm.

One of the desert mysteries is the mirage, which constantly deludes the traveler. The hot air of the desert causes objects to change shape in the distance and often makes things seem nearer than they are. The blue sky is reflected into every little depression and causes it to resemble a lake; or wandering camels are so distorted as to appear as dark palm groves.

The beautiful coloring of dawn and sunset on the Sahara Desert is more gorgeous than can be described. The sun, moon and stars are especially clear and they seem very close to the earth. The stillness of death has settled down on this vast land. The entire desert gives to the traveler a feeling of mystery and unreality.

PLATEAUS

A plateau has a close connection with a desert, for many plateaus are simply high arid regions. This is usually due to their association with the mountains, which cut off the rain-bearing winds.

A plateau is an elevated plain, with horizontal strata. Due to their extreme height, their climate is usually cool. Plateaus are the result of the uplift of the land surrounding mountainous regions. Their surface is rugged. Examples of typical plateaus are the great plains at the base of the Rocky Mountains and the Columbia Plateau of Oregon and Washington. The Himalaya Mountains have uplifted the great plateau of central Asia. The high plateau regions of Africa and Arabia are typical desert lands, capable of supporting no plant or animal life.

The raising of cattle and sheep is almost the only occupation which thrives on these elevated plains. Their rugged surface often makes agriculture impossible, even where the moisture would be sufficient for plant life. The great cattle and sheep ranches of the western United States are excellent examples of plateau regions where grazing thrives.

Photo by Agnes W. Vaille *Courtesy of National Park Service*

LONGS PEAK, FROM A SMALL LAKE AT ENTRANCE TO GLACIER GORGE, ROCKY MOUNTAIN NATIONAL PARK

THE WORLD'S NOTABLE ICE-SHEETS AND GLACIERS

BY JOSEPH LEWIS FRENCH

It was not until the beginning of the nineteenth century that men began to study the results of ice-action. Before that time great fields of ice were of course known to exist, but floods were thought to have been their origin, and ice had always been regarded as a kind of rubbish. When, however, men began to climb mountains in earnest the phenomena of ice-action began to gain serious attention, and since then the ancient origin of glaciers has been discovered.

During what is called by geologists the Pleistocene period, the latest of the three great geological periods, far back in a time long before history begins, all of northern Europe and northern America were one vast field of ice, just as the polar regions are to-day. This period is called "The Great Ice Age," because during this time great ice-sheets were flowing over the land, grinding the rock-surfaces, and transporting debris in the manner that we may observe in the glaciers which exist to-day.

The exact cause which brought about the lowering of temperature that made the Ice Age has never been discovered. No geological changes since time began have been more important to man than those of "The Great Ice Age." Vast portions of the earth were stripped of soil, leaving only bare rocks. Old soil and new soil were removed from vast areas and deposited in others. Valleys were filled, often to a depth of 300 to 400 feet. Rivers were diverted from their courses never to return, and lakes of vast size were created by the damming of old outlets. "The influence of this period," says an authority, "upon the distribution of plant and animal-life in northern latitudes can hardly be over-estimated." It was in

this period of the great cold that glaciers came into being, as we have them today.

WHAT IS A GLACIER?

A glacier is a mass of compact ice that forms out of a snow-field and can be born anywhere on earth where the altitude is permanently above the snow-line, for there the temperature is always below freezing-point. Like all other manifestations of nature, glaciers have their functions. They, with the avalanche, than which they are far more important, are the two chief agents in removing the excess of snow that accumulates on lofty plateaus, or in the hollows among mountain peaks.

The first glaciers to be studied were those of Switzerland; this was done by men such as Professor Louis Agassiz, of Harvard, and John Tyndall and J. D. Forbes, of England. These glaciers were comparatively small, however, compared to the great masses of glacial ice in the vicinity of the polar regions. The exploration of the glaciers of Mt. St. Elias in Alaska has been made under the direction of the United States Geological Survey, and England has performed a like service in the island of Spitzbergen, north of Russia.

From the great glacier to the great ice-sheet is but a step. The largest of these are of course also in polar regions, and have been traversed by two of the latest explorers, Nansen and Peary. The latter in his last two dashes for the Pole performed journeys over the ice-sheets which far outdistanced those of the previous explorer.

The forming and functioning of a glacier is thus explained by a recent authority. "In the higher regions of a snow-field the snow on the surface is loose and open in tissue, but in the deeper layers much of the imprisoned air is squeezed out by the pressure, and the snow is more compact." On mountain slopes, and at the heads of valleys, the snow gradually acquires a slow, gliding movement; this further enables the air to escape and the snow passes into a firm granular condition known as *neve or firn.* Where the slope is gentle the *neve* may extend for miles with an almost unbroken surface, but as the descent becomes steeper, and the snow, confined within valleys, is pressed downward from the sides as well as from behind, it gradually loses its granular, crystalline structure, and passes into clear blue, compact ice, streaked with white veins where the air has not been thoroughly expelled. The little tongue of ice which begins to steal down the valley is soon joined by others until it swells into a great river of ice, perhaps hundreds of feet thick and many miles long.

A glacier like this may extend a long distance from the snow-line before it is finally melted, terminating perhaps far down the valley in the neighborhood of cornfields and orchards. The lower end of the great Tasman glacier on the west coast of New Zealand is hidden by a grove of pines, beeches, and arborescent or tree-like ferns. All great mountain chains have glaciers varying in size. In the Himalayas they reach a length of sixty miles. Our own Rocky Mountains glaciers are not of great size, but in Alaska vast sheets of ice fill the valleys near the coast.

The grandest glaciers of the world are of course those of the polar regions. In Greenland tongues of ice 2,000 to 3,000 feet thick, and sometimes more than fifty miles wide, steal down the valleys and push their way far into the sea, where they finish their career by breaking into icebergs.

AN ALPINE GLACIER

Let us describe an Alpine glacier, so as to give you a better idea of how these ice-rivers behave. Such a one tapers down to a long point, finally terminating in a rough slope of ice. From an arch in its base issues a torrent of muddy water, especially large in summer when the ice melts rapidly. Such a torrent sometimes forms the source of a river, as in the case of the Arveiron in Switzerland. On a sunny day numerous little rivulets on the surface of the ice-mass help to swell the volume of this outpour. The valley below the ice is strewn all over with earthy debris, blocks of stone and boulders, often of great size brought down from above by the glacier. Sometimes these pile up into great heaps and ridges. This accumulation is called the *moraine.*

Sometimes it is possible at the end of a glacier to creep in a little way beneath the ice. Here we find the hard rock smoothed and even finely polished, and sometimes crossed by scratches ranging from the finest striations or fine thread-like grooved lines to deep scores, many feet in length, all running in the direction in which the glacier moves. These are not produced by the ice itself but by stones and pieces of rock firmly frozen into the bottom of the glacier. Dragged with resistless force over the surface of the work, these stones themselves are ground down, polished and scored also. No other agent in nature can do this. A valley that has once held a glacier tells its story with unerring certainty thousands of years after.

One important effect of glacial movement is the formation of crevasses or fissures. At first these are merely long, very narrow cracks in the ice,

not wide enough to stick a knife-blade into. Slowly the walls move apart till they at last form a yawning chasm extending from the top to the lowest depths. A coping of snow collects on the edges from which hang great icicles often many feet in length. This snow conceals the fissure to some extent and becomes a source of great danger to the mountain-climber, who may fall into the unseen crevasse, and many lives have been lost in this way. It is still more dangerous when the two edges overhang, forming a temporary bridge. Temporary lakes are formed when, as occasionally happens, a glacier moves past the end of the tributary valley and dams back the stream which is flowing down it. The water increases until it bursts its dam, and trees, cattle, and even villages are swept away in the flood. Such a lake, estimated to contain 800,000,000 cubic feet of water, formed in 1818 in the valley of the Danse in Switzerland. A tunnel was bored through the ice and the pressure was relieved, but the barrier gave way before it was emptied and great damage was done to the farms in the valley below.

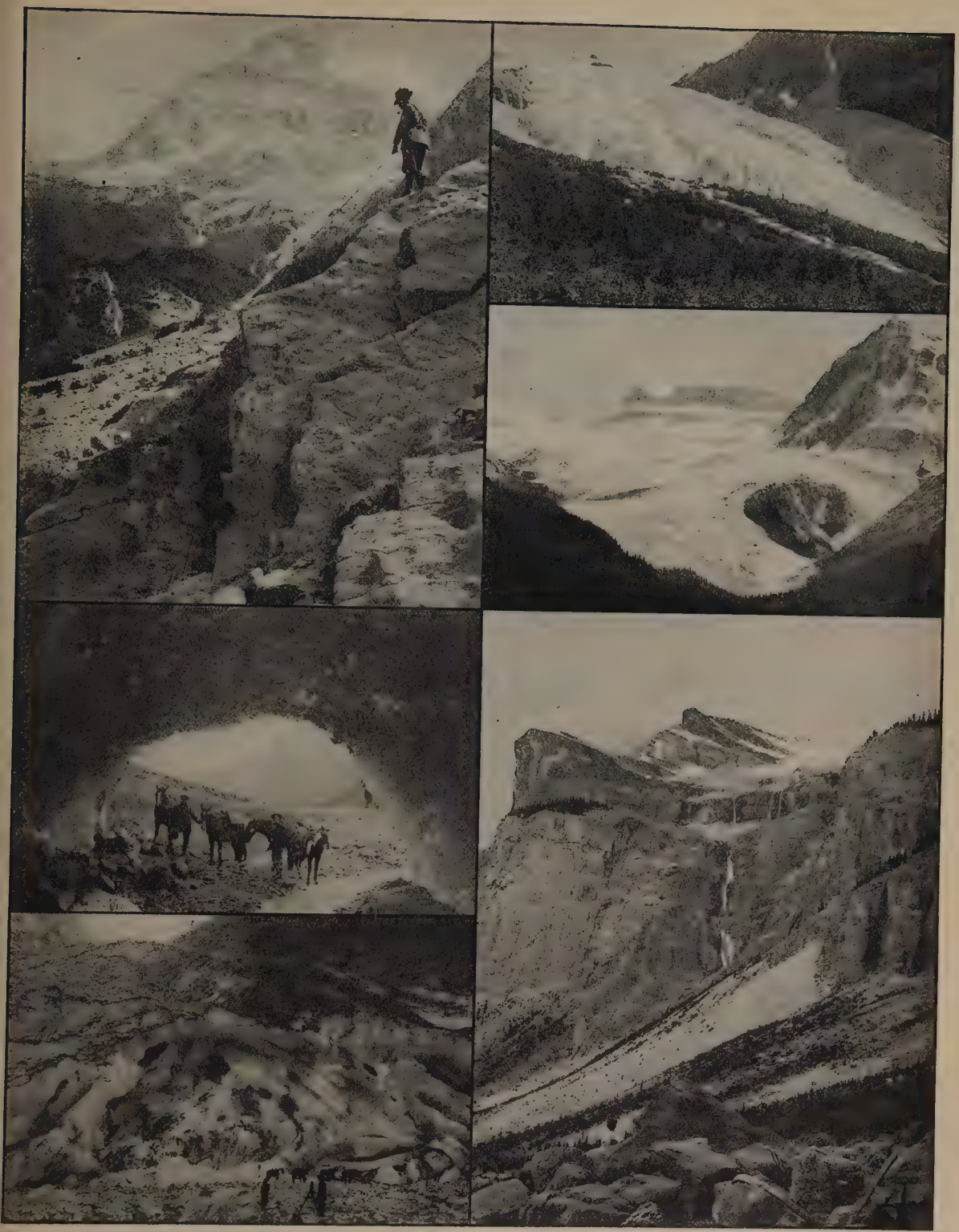
The movement of a glacier downward follows the law of gravity, but it is made possible by the melting of the ice at the points of greatest pressure. The hard, brittle ice behaves just like pitch or rain and squeezes through narrow valleys, and makes its resistless way over rough uneven surfaces. The movement of a glacier is very slow indeed; outside of polar countries not more than a few inches a day. Mark Twain, in "The Innocents Abroad," tells how after reaching the top of the Riffelberg he intended to make the descent by sitting on the glacier and sliding down to Zermatt! In the Alps the greatest movement in summer of the center of a glacier is 20 to 29 inches a day and of the sides 13 to 19 inches. One of the Greenland glaciers which is five miles wide moves 30 feet, and that of Jakobshaun has been observed to travel from 48 to 64 feet in 24 hours. In winter the movement is reduced one half. In 1827 a Swiss, Professor Hugi, built a hut upon a glacier to observe and record its movement. Three years after he was 330 feet lower, in 1836, 2,000 feet lower, and in 1841, fourteen years after, 4,712 feet had been traversed by the great mass of ice.

THE GREAT GLACIERS OF THE WORLD

Perhaps the largest glacier in the world is the Malaspina, on the slope of Mount St. Elias in Alaska. This covers an area of 1,500 square miles and is about 1,500 feet above sea level. It is formed of several large glaciers from the mountains further inland and is over 70 miles in width at its termination, with an average breadth of 20 to 25 miles. Looking down on the Malaspina glacier, from an elevation of 2,000 to 3,000 feet, on a clear day, its limits are beyond the reach of vision. It is gradually melting away.

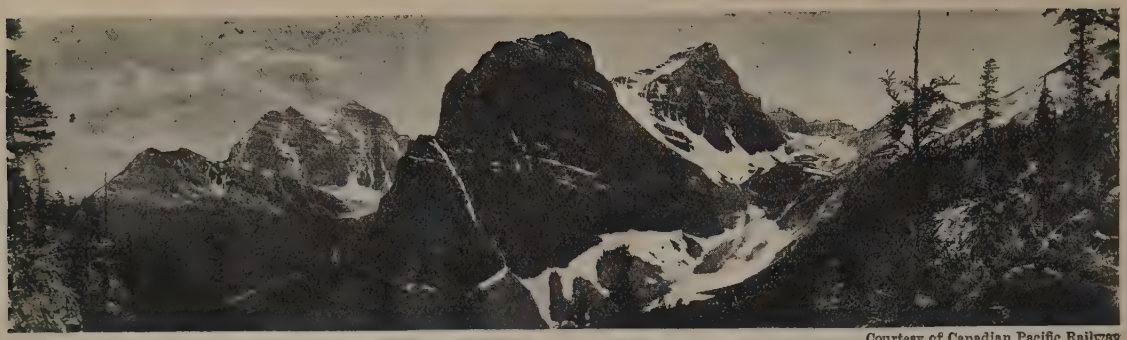
In many parts of the polar regions, north and south, the snow and ice fill the whole country to such an extent that only the tops of the highest mountains can be seen. These are called ice-sheets. The largest ice-sheet in the northern hemisphere covers nearly the whole of Greenland. It is almost 1,500 miles long and 400 miles wide; and covers more than half a million square miles. Several attempts were made to cross this by explorers, and the feat was finally achieved by Nansen in 1888, who made the complete crossing from coast to coast with five companions. But a more remarkable journey was made four years later by Commander Peary, who traveled a distance of some 1,300 miles with sledges, 1,100 miles further north. Some of the glaciers which draw this great ice-sheet are of enormous size. The Humboldt Glacier has a frontage at its termination of more than sixty miles. Sometimes these glaciers terminate at sea-level in vertical walls of ice hundreds of feet high. Great masses of ice break off and float away as icebergs, which sometimes drift several thousand miles before they melt away.

There are other vast ice-sheets in Spitzbergen and on the archipelago of Franz Josef Land, but none of the size of that which covers Greenland. Yet even in Greenland, on the coasts adjoining the great ice-sheets, small shrubs, grass, and even flowers flourish in scattered nooks during the few weeks of summer. The Arctic birch or willow grows thickly in the ravines, but never to a height of over two feet. The floral wonder of Greenland is a very small plant which lives and grows upon the surface of the snow, sometimes spreading over a large area, to which it gives a delicate rose color. This is what is called by the Arctic explorers "Red Snow." Our knowledge of the ice-sheets which form within the Antarctic Circle is still limited. The South Pole did not attract the attention of explorers until within very recent years, and therefore the great glaciers of that region are not so well known.



Courtesy of Canadian Pacific Railway

(1) CHRISTIAN HAESLER (GUIDE) AND A TOURIST CLIMBING ILLECILLIWAET GLACIER, B. C. (2) HORSE THIEF GLACIER, WINDMERE, B. C. (3) HORSE THIEF GLACIER, WINDMERE, B. C. (4) GREAT GLACIER, NEAR GLACIER, B. C. (5) GLACIER, NEAR FIELD, B. C. (6) TAKAKKAW FALLS, YOHO VALLEY, NEAR FIELD, B. C.



Courtesy of Canadian Pacific Railway

A VISIT TO A COLORADO GLACIER

BY F. H. KELLOGG

In the northern part of Colorado, a spur range of three peaks extends in an easterly direction from the Front Range of the great Continental Divide. This little spur is called the Mummy Range, from a fancied resemblance to an Egyptian mummy reclining at full length. The highest point, Hague's Peak, forms the head, and a somewhat lower summit two miles to the north and west marks the knees of the prostrate figure; the feet extend to the Front Range, where the third peak, Mount Fairchild, raises its gigantic form.

On the northern slope of the second peak there rests an immense mass of snow and ice, which, in the light of recent investigation and discovery, has greatly increased in interest to the mountain-climber and explorer. The very existence of this snow-field is a comparatively new discovery, and until a few years ago the number of visitors to the spot might easily have been counted upon the fingers of one's hands. That this is so is due partly to its isolated and concealed situation, and also to the distance to be traversed and difficulties to be overcome in making the trip.

This mountain, the Mummy, lies twelve or fifteen miles directly north of Long's Peak, in a portion of the country scarcely ever visited, either by neighboring residents or tourists from abroad. The nearest settlement is Estes Park; and from this point the expedition requires three or four days, for great difficulty is experienced in carrying blankets and provisions necessary for so long a stay over the devious and difficult route which affords the only possible means of access to this range.

Upon the occasion of a visit to Estes Park during the summer of 1890, vague reports of the wonderful object on the Mummy came to the ears of a party of several university students, of whom I was one. We were then camping in Willow Cañon. It extends in among the mountains, and it then furnished a site for the last human habitation this side of the Continental Divide. As soon as we heard that an actual glacier was within reach, we at once resolved to see it, and active preparations for the trip were immediately begun.

The history of the discovery of this glacier is an interesting one. An old bear-hunter chanced upon the field on Mummy Mount, which he called "the largest snow-field in the Rockies." Before his death, which occurred shortly after, he mentioned this discovery to a gentleman then living in Denver, who devoted much time to the exploration of new mountains and strange localities in and about this neighborhood.

In 1882 this gentleman, a Mr. Hallett, visited the spot entirely alone. In trying to ascend the north side of the ice-field, he suddenly broke through the bridge of a hidden crevasse; but by extending his elbows, he managed to extricate himself from his perilous position and returned in safety to his camp. This incident finally led him to wonder whether this might not be a glacier. In 1886 and 1887, Mr. Hallett, in company with an experienced mountaineer who was as familiar with the Alps as with the Rockies, twice revisited the spot. Upon the first of these expeditions, after a careful examination, the true nature of this vast expanse of snow and ice was, for the first time, positively determined. Here, in the heart of Colorado, existed a true glacier showing crevasses, moraines*—in short, all the characteristics of the well-known Alpine glaciers of Switzerland. To this was given the name it now bears, "Hallett Glacier," in honor of the

* A moraine is an accumulation of sand, broken stones, and rocks along the edge of a glacier.

THE GRAND CAÑON OF THE COLORADO
From the painting by Maxfield Parrish

man who, in such a startling way, made the first real discovery.

We had no guides and few directions; but we could, from a distance, distinguish at least the Mummy from the surrounding mountains, and we trusted in our ability to find some way, unhampered as we were by any great amount of luggage.

Just before leaving Estes Park we halted at a ranch for a final adjustment of "Billy-the-Burro's" pack and a general making ready for the climb, now just ahead. On the way we encountered an old mountain stage-driver, grizzled and weather-beaten, who seemed much interested in our party. After carefully inspecting our various equipments, he asked: "Whar mought ye be a-goin'?" One of us replied: "To the Mummy. Ever been there?" "Bin thar? Bin thar? W'y, looky here, young chap; I 've bin thar when you did n't hev no more sense 'n a tarmidgun [ptarmigan]. But yer better take an ol' man's advice an' stay ter hum; fer ye 'll never git back ag'in—nobody ever has. Take my advice, and let ol' Mummy alone."

We wondered how *he* got out alive, but we refrained from questioning him further.

Undaunted by this terrible warning, we trudged gaily along, and, leaving Estes Park, entered Black Cañon, carefully noting, for possible guidance on our return, peculiarities along the route as we traveled.

Soon we were completely enveloped in the mysterious shades of an immense forest. Pushing steadily on, we arrived, at about dusk, at the base of a peak which we thought to be our destination, the Mummy. We halted here for the night, and pitched our camp, which process consisted merely in throwing off our packs and starting a fire. A threatening storm induced us to gather a great pile of logs near the fire, in order that a rain might not deprive us of this the one great solace of a night in the open. We had barely finished our supper when the storm broke upon us, cold rain and sleet, for at that elevation, of about ten thousand feet, it was cold, and there was snow on the mountain peak above.

THE HALLETT GLACIER—NEAR VIEW.

At this height the small scrubby trees afforded but little protection against the rain, so we wrapped ourselves in rubber blankets and, with feet to the fire, lay down to sleep.

Early the next morning all was bustle and activity. As we prepared our breakfast of ptarmigan and coffee, eked out with cold supplies, the clouds rapidly disappeared, and the first rays of sunlight tinged the peaks and forests with a delicate pink. Delighted with this favoring weather, we started again on our search for the glacier. We made rapid progress, and in a few hours stood just at the foot of the topmost cap of the huge mountain under whose shaggy mane of spruce we had encamped for the night.

We rounded the cap, expecting, as we reached the north side, to come upon the glacier. Instead we saw nothing but great rocks strewn everywhere upon the bald top of the mountain. Ahead for several miles we saw a deep chasm, presenting the only possible location for a snow-field of great size.

This chasm, within whose inclosing walls might be concealed the object of our search, really cut into the mountain lying next to the west; and this, we thought, could not be the Mummy. We were, therefore, undecided as to our course. By this time it was late in the afternoon, so we divided

our party into two sections and started off in slightly differing directions; but the day was now too far gone, so we were soon obliged to return to camp without being rewarded in our search.

The next morning we made a long detour around the side of Hague's Peak, avoiding the most difficult climbing, and soon found ourselves within the former pathway of the glacier, an immense chasm strewn with rocks piled on rocks for miles and miles, a most wild and desolate scene. From this point, however, we could see the upper snows of the great mass, and, greatly encouraged, plodded on. After some two hours' scrambling over rocks, we neared an immense rocky ridge or dike extending across the gorge, which we rightly took to be the terminal moraine of the glacier lying above.

I ran, jumped, and fell in a wild scramble over the irregular piles of rocks, my camera bouncing and bumping on my back and shoulders. After a distance of about a half-mile was thus traversed, I climbed the dike, and the whole mass was in sight. Before pausing to really admire the grandeur of the scene before me, I adjusted my camera and made five quick exposures. In a few moments the clouds came twisting and curling in at the head of the gorge; then, settling down, the whole view was obscured in a dense sea of mist and fog.

An immense snow-field, about a quarter of a mile in width, extended to the top of the mountain, a thousand feet above. Its whole extent was covered with grooves, markings, and cracks. A little lake, formed by the melting of the snow and ice above, nestled at the foot of the ice-field, its waters imprisoned by the great dike. This lake was partially frozen over, and in the occasional open spaces large blocks of ice were floating round. Moved by the force of the wind, they grounded upon rocks or firmer ice underneath, then were lifted up with a groaning and creaking, varied by sudden splashes, as large fragments broke off and fell into the water. The lower edge of the ice and snow projected over the water, rounded off in beautiful combings and rolls, apparently about to drop off into the lake. Even as we looked, our attention was attracted by a sharp crack, followed for a few seconds by a continuous crackling sound; then, with a loud report, an immense block of ice broke off and fell into the water with a great splash, showing us in miniature the process by which great floating icebergs are formed in the Arctic seas before they set out on their long voyage.

HALLETT GLACIER FROM ACROSS THE LAKE

COLLECTING NATURE MATERIALS*

BY KATHERINE BEEBE

It is a mistake to think that little children, unaided, will become observers and lovers of Nature. We of the present generation have but to look back to our own childhood to prove that. In spite of child's love of outdoor life and his keen interest in all he sees, that interest will become dulled and blunted if his questions are not answered and his efforts appreciated. To be much out-of-doors with the children, to follow their restless leadings, to be interested where they are interested, and to be able to lead them into "fresh fields and pastures new" when they are ready to go, is to "live with our children" as Froebel hoped we should some day.

PLAY WITH FRUITS AND NUTS

This lover of children laid great stress on sense-games in his book for mothers. He would have them train the senses of their children to acuteness and discrimination by means of play. In one kindergarten this idea was carried out in September by means of the fruits so abundant at that time. A number of these were provided, the number suited to the ages and abilities of the children; who named them and counted them, and also drew them with colored chalk. One child's eyes being blindfolded, another child hid one of the fruits. It was then the turn of the blinded one to guess which fruit was missing, and if he guessed correctly he was "heartily cheered"; if his guess was wrong, he tried again another time. This was played as long as the children were interested, and on another occasion a game of guessing, by feeling the fruits, filled a half hour, while still later they were guessed by smelling and tasting.

Such games as these, when taught to children and played occasionally with them, ought to set them going in this particular direction to their own physical, mental, and spiritual upbuilding. Older children delight in these simple kindergarten games and seldom have the opportunity they wish to learn and use them. In their playing school or playing kindergarten they could amuse both themselves and younger brothers and sisters in this way, for the games can be played with nuts, leaves, shells, stones, blocks, flowers, grains, children, and miscellaneous objects.

Nuts, used after this manner, make delightful playthings, and kindergarten children delight in playing they are squirrels and hunting the nuts previously hidden by one of their number, especially if privileged to eat the nuts at the end of the game. Hunting nuts in the real woods is a joy which children should taste oftener than they usually do, for in these days of railroads and electric cars, the woods are not so very far off, and once a year at least there should be a nutting party in every well-regulated family.

MAKING NATURE COLLECTIONS

If, in the Indian summer days, after the leaves are off the trees and the birds have flown, a collection of nests could be made from the woods, parks, or suburbs, by means of excursions in company with a boy of tree-climbing age and propensities, a work worth doing would be wrought in the minds and hearts of all concerned.

Nothing gives children more pleasure in the Fall than milkweed pods full of the "dainty milkweed babies." Go where these are to be found in September or October; bring them home and let them dry in the house; explain to the children why they are furnished with wings and how

* From "Home Occupations for Little Children," by Katherine Beebe, published by the Saalfield Publishing Company, Akron, Ohio. Used by permission of the publishers.

the wind plants them; let them have some pods to play with out of doors on windy days; and let them make pretty winter bouquets of dry clusters of the pods for friends and relatives. Little girls can make down pillows of the seeds for their dolls, and an ambitious child could even collect enough for a down pillow for a real baby. Thistledown can also be used in this way.

During the Autumn the different kinds of seeds and seed-pods greatly interest the children, who would enjoy gathering them if there was any reason which appealed to them for so doing. The interest of the older people in such a collection is sufficient oftentimes to stimulate them to effort, but a real object, such as saving for next year's garden, making a collection for a present to somebody, or gathering quantities to be sent to city relations, or anyone poor or sick, appeals more to the child. He is a seasonable little being and does not care to do things which are not "worth while," any more than we do. An examination of the seeds with a microscope will repay anyone, and no child will fail to be interested in the perfectly formed leaves tucked up in many seeds all ready for next year.

PLAY WITH LEAVES AND ACORNS

When the leaves begin to fall, playthings are literally showered on those children whose eyes and hearts true sympathy has opened. It is a commonly pathetic sight in autumn days to see a little child gathering the bright leaves with a wistful what-can-I-do-with-you expression, only to throw them away. If he brings them into the house, they are often unnoticed and uncared for, and the most he can expect is to have them put into a glass of water and forgotten. The names can be learned; guessing games can be played with them; they can be traced, drawn, and painted; beautiful borders and patterns can be laid with them; tea-tables can be decorated with them; wreaths and festoons can transform the child into an autumn picture for his father; they can also be pressed, varnished, and waxed.

In the great masses of dead rustling leaves are delightful places to play squirrel and rabbit games, and for a romp, what material is better adapted for tossing, rolling, and throwing? Children will rake leaves patiently, if, when Father comes home, they can be present at the bonfire.

Baskets of acorns will be gladly gathered if they can be used, and in many a city kindergarten they would be treasures indeed. The double acorn cups can be strung by slipping the string between the two cups. These productions give much pleasure to the children who have to find the double acorns and string them, as well as to the baby brother, sister or neighbor to whom they can be presented.

OTHER COLLECTIONS

Corncobs in quantity made in olden times, and still make, charming playthings, and a corn-husk dolly would be a greater treasure than one from a store to many an indulged child. Wild cucumbers and toothpicks will stock a miniature farm with bristling pigs, and the vines can be grown in almost any spot of earth where there is good soil.

Stones always interest children, but the interest is a fleeting one for the reason that limitations are reached so soon. If a place is prepared for a collection of the most attractive stones, and if the mother can tell her child a little of their history, an added stimulus to patient hunting and sorting is given.

The bright berries of Autumn, the haws, thorn-apples, and cranberries are beautiful for stringing purposes, making a pleasant change from beads and buttons. In season, clover heads, dandelion heads and the tiny flowers which make up the lilac's blossom make good material for stringing, and this industry should be added to the familiar occupations of making dandelion curls and chains.

NATURE HANDICRAFT

Get a sheet of dark bronze paper on whose white side flying birds can be traced from a pattern. The model can be drawn and cut out of pasteboard, or a picture be made to serve the purpose. Let the children trace and cut out a flock of these birds; fasten them high up on the nursery wall, headed south in the Fall, and make others which can head north in the Spring. Sets of these can be made for friends and saved for Christmas and birthday gifts; for a present which is not the child's own has little value, as a gift, in his eyes compared with one which has cost him effort or sacrifice.

Where children can have the use of hammers and nails, they can make crude bird-houses in which real birds will live all Summer, and they will often spend a half-hour raveling out bits of coarsely-woven cloth, which, hung on bushes, trees or fences in the Spring, are to furnish the birds with nest-building material.

THINGS THAT LIVE AND GROW

A globe or other receptacle in which fish can be kept will be a treasure to children old enough to go about alone or fortunate enough to possess a grown-up real friend who will take them occasionally where they want to go. It will give a

reason for the collection of frogs' eggs, tadpoles, tiny minnows, crawfish, and mussels. How children loves these things, and how seldom is it worth their while to bring them home. "They are very interesting, dear," says Mamma, trying to repress a look of disgust, "but we have no place to keep such things. Throw them away." A tub in which water from their own homes and breeding-places can be placed seems to agree best with tadpoles, by the way.

To learn the trees by name, to know their blossoms and seed, is a pursuit in which old and young may join with mutual pleasure and profit. The country is full of thriving little seedling trees which, striving for life in vacant lots, parkways and roadsides, will one day become real trees, if transplanted into an amateur nursery. Someone once suggested that if, for every child born, a tree, seedling, or seed were planted, the forestry problem would be solved.

A miniature fruit farm can be made by planting apple, peach, plum, pear, cherry, orange, or lemon seeds, and, while it may never reach a very advanced state, the planting of the seeds, the watching for the first shoots, and the observation of the tiny trees will fill up some of those industrial vacancies for which we are trying to provide. When we were children there were few Springs when we did not plant a vegetable garden in an old dish-pan or cheese-box, using for planting purposes one potato, one beet, one onion, one turnip, and one anything else we could get. I do not remember that there was ever any outcome to this agricultural enterprise, but I have a very distinct recollection of the pleasure this tilling of the soil gave to me. I will add that we lived in a city and that our backyard was boarded over, but to the true farmer-spirit all things are possible.

The collecting of cocoons in the Fall will give occupation at that time as well as later on when the moths come out. These are found in both city and country, and a study of them will prove most interesting.

MORE NATURE PLAYTHINGS

Of the small snail shells found on the lake shore, and in gravel piles, strings can be made, as they usually have holes in them. A child will hunt patiently for these treasures even when he has not the hope of using them. Babies and younger children are delighted recipients of such gifts as these, and the fact that they so soon tire of them need not affect either the work or the satisfaction of the donor.

Drinking-cups can be made of large leaves pinned together by their stems, and those of us who read the Rollo books long ago remember that the backs of the lilac leaves can be used for slates if pins are the pencils. I have known kindergarten graduates to reproduce their brief educational experience, using pebbles, twigs, leaves, dandelion stems, and burrs for material. The pebbles were seeds, the twigs sticks, the leaves folding papers, and the burrs clay. They even wove coarse grass into mats and did pricking with thin leaves and stiff grasses.

The burdock's prickly seed-pod can be made, not only into baskets and nests, but into animals, furniture, and almost any sort of object. It is well to protect little hands with old gloves for this work, for the burrs leave invisible splinters in the fingers, which are very uncomfortable. Until one has tried it, one does not know how lifelike and satisfactory to the children are the squirrels, rabbits, dogs, cats, and elephants which can be made of either the green or the brown burrs. The goldenrod galls can, with a knife and the addition of grasses or stems, be transformed into tiny vases and dishes. Flower dolls make beautiful fairies with their pansy, daisy, or dandelion faces, their leaf shawl and poppy or morning-glory skirts, and "pea-pod boats with rose-leaf sails" are delightful possibilities.

MAKING A FAIRYLAND

I know one child whose delight it was to make fairylands, filling a shady corner or shallow box with moss-covered earth in which she planted miniature trees, flowers, and shrubs, sinking a saucer, which could be filled with water, into the ground for a lake.

On a lakeside or seashore the construction of hills, mountains, islands, and rivers gives even a little child at times more satisfaction than his own rather aimless building of houses. One group of children made the Michigan fruit farms and a smaller Lake Michigan, over whose waters fruit-laden boats sailed to city markets.

Radical as it sounds, water makes a delightful plaything, but it is seldom used because—it is too much trouble! Happy is the child equipped for play in a fresh puddle left by the rain, or in a tub of water in the backyard! Happy is the child who is sometimes dressed for a frolic in a warm summer shower, who on hot days is allowed to play in the bath-tub or with the hose! Happy are those children who, when taken to shore or beach, are dressed, or undressed, so that they will not have to be cautioned every other minute not to get wet! The old familiar rhyme beginning "Mother, may I go out to swim?"—you know the rest—would be appreciated by many children on lake shore and ocean beach if they happened to know it.

Mother Nature, with her sunshine, rain, wind, hail, snow, and various commotions and combinations of the elements, is always ready to play with the children, and they with her, were they only allowed to do so. They are not allowed because of the fear that they will soil or injure their clothes, hurt themselves, take cold, or be too much trouble to someone, and so they lose many hours which, through the happiest play, might bring to them health, courage, freedom, and joy.

NATURE STUDY

BY MRS. BERTHA PAYNE NEWELL

AUTUMN WALKS

Autumn is a fine season for rambles afield. It used to be our regular custom to take the children for long tramps on Sunday afternoons especially, when we would come home loaded with spoils—branches of scarlet oak leaves, stalks of milkweed pods, cocoons on bare twigs, pockets weighted with red thorn-apples, acorns, hickory nuts, beechnuts, or chestnuts.

When we went in the direction of "Mossy Hill," so named by Nancy, she loaded us all down with such quantities that we were fairly staggering under "just this one piece more." This every southern child knows makes the loveliest moss houses, built around tree-trunks and kept green with frequent sprinklings, and it can be furnished with cobblestones and twigs, with acorns for dishes.

The red rose-hips and haws figured as fruit at doll feasts, and then were strung. The leaves made the mantel beautiful awhile, and some were ironed with a flat iron passed over beeswax and put away for Hallowe'en and Thanksgiving decoration.

The milkweed pods were so beautiful that we painted their pictures and then used the down to stuff doll-pillows, with lace casings thin enough to let the silky down show.

Pretty stones and snail shells were put in our collections. Crawling caterpillars were great finds, to be carefully brought home and with them the plant on which they seemed to be at home for food. We made homes of shoeboxes, punched airholes in the lids, set the leaves in a bottle of water inside, and sometimes were rewarded by finding that a cocoon had been spun overnight.

Harvesting

In gathering the yield of the home garden we notice the different kinds of corn, the color, depth of kernels, and the arrangement in rows on the cob. We put away sweet corn for parching, pop corn for winter-evening poppings, and pumpkins for their many good uses. Each has its appeal to the senses, to be felt, weighed in the hands, smelled, and in good time tasted. A guessing game is fun. Blindfold each child in turn, and see if he can distinguish each vegetable by its odor. Do the same with *feeling,* which is a good test for carrots, beets, turnips, salsify, etc.

Special nutting parties make great occasions, long remembered. We often noticed that someone had been before us by the empty shells. When we examined them, we saw they had not been broken but gnawed in two. The whisk of a bushy tail and an angry chatter in the tree overhead gave a clue to the worker, who expressed vigorously his opinion of the two-legged invaders of his premises.

Questions You Can Help Children Think Out

What do squirrels eat?

Do they put away food for winter?

Where do they stay in cold weather?

What other wild animals spend the winter near us?

Where do the rabbits live? Chipmunks? Gophers? Field mice?

Tree-Life

Notice twigs from which the leaves have fallen, leaf-scar, and new bud.

Distinguish by bud, leaf, bark, and color of bark the common trees, such as maple, hickory, willow, apple, and cherry.

General Suggestions

All the wealth of seeds, fruits, nuts, falling leaf, and safely packed bud tells the story of preparation for Winter and for continuing life in Spring. Little talks, stories, and songs help children to see this meaning.

Helping to gather and store fruits and vegetables is one of the best ways to impress children with our dependence on these foods. Where there is no home garden children may be taken to a farm or truck-garden, and every city child can visit markets and fruit-stands.

After such visits let them tell Father, or someone who did not go, what they saw, making it vivid by drawing some of the most interesting

things. This will help hold them in their memories clearly, and center attention on things that mean most to them. Expression of some kind is half the value of such experiences. Take crayons and tablet with you and have a sketching party on the spot when there is some special trip.

Painting is naturally invited by the gorgeous colors of Autumn. Trees make splendid splotches of color seen against the blue skies, good subjects for little fingers just learning to paint in broad washes.

Play fruit-stand and market, and advertise the goods on sale in markets by pictures of fruits and vegetables done on big sheets of manila paper.

It has worked well in my experience where there are several children, to let each one adopt his own tree and keep a record of it throughout the year—in autumn dress, bare in Winter, showing its first tinge of spring color, in blossom, and last in full green. Twigs can be painted through the Spring, showing detail of leafage.

The older kindergarten children much enjoyed looking over these records, which I labeled and put away for each child and gave them at the close of school in June.

During late autumn walks abroad you may set the children to hunting for leaf-mold for their window boxes and pots. Learn to distinguish this and loam from clay, by the bits of rotted leaf, twigs, and rootlets. See the shining particles of sand mixed with it. Distinguish it by smelling the earthy odor, let the fingers feel its soft crumbliness, and the eyes take in its rich, brown color. Contrast it with the smooth, hard, clay texture. Let wet mold and wet clay dry in the sun and see which one would be the better for tender roots and thirsty mouths. (Have plants mouths?)

In digging under the fallen leaves you may find the brown, dry leaves of the hepatica, or green ones of the violet. Dig deep and bring them home with plenty of earth about the roots and plant in your wildflower garden in a shady spot. Add to it in springtime the characteristic woodflowers of your locality. It will be a joy for countless succeeding Springs to you as well as to the children.

In your hunt for roots and mold look out for insects in winter quarters, under stones, logs, and the crevices of bark. Count the kinds found.

WINTER

While the outside plants are hidden is a good time for window-gardening. The cook will appreciate a box of chives and parsley, and the canary a tender lettuce leaf now and then. It is quite possible.

Winter ice, frost, and snow make sports the great thing now. The sand-table can be turned into a miniature skating rink or frozen pond by imbedding a sheet of glass and sloping the banks down to it. Cut paper skaters, fold paper sleds, build little houses on the bank of blocks or paper. Sprinkle cotton snow over the sand if you wish.

How does the ice look in making? Notice a puddle. Ice fingers are shooting across it, like straight, sharp-jointed spears. How is snow made? Catch the falling flakes on a dark coat and look closely. Use a magnifying-glass to see the wonderful stars. Let the children draw what they see.

If you can get mineral crystals, such as quartz, galena, amethyst, or rock salt, that are very striking and plain in their angular forms, it would be a good time to get them out for a feeling-and-guessing game. Notice how soft coal breaks in angular chunks. This has a crystal form also.

Make a saturated solution of salt. Pour it in

a saucer and let it evaporate. Lay strings over the edge of the saucer into the solution and notice what happens to them.

SPRING

Now the seeds collected last Fall can be brought out and those that need an early start planted in window-boxes. The bulbs that were put in their pots before Christmas are brought into the light and warmth and watered.

Just to see plainly how a seed starts to grow, put some large beans to soak in warmish water in a saucer. Cover with cotton and put near the stove. Watch the overcoat grow loose and wrinkly. Then it tightens and two fat halves of the bean pop out. What a wonder of a tiny plantlet is packed within! Just a pair of folded leaves and a white rootlet that grows so fast you can almost see it move.

Let each child "take its picture" every morning, as we took the snapshots of the baby every few weeks. Of course it must be put to bed in the earth and watered every morning. Note the gradual lifting of the earth as the bean-leaves "back" out of the soil; the greening and thinning of these storehouses of food. Ask where the plants get the stuff to make it grow so fast, and where the children get it? Has the bean a mouth?

Put some oats on a piece of cheesecloth tied over the top of a glass of water. Let the cloth sag into the water until sprouts appear. Note growth of roots. Where are the mouths likely to be? Paint the picture of glass and contents several times.

Cut the tapering root from a carrot, hollow it out and tie a string to it and hang it stem end down in a window. Keep water in the hollow, and watch greenery appear. Paint picture. Keep record of a bulb's progress in the same way.

Keep a lookout for the first hint of swelling treebuds. One year I brought twigs of willow, lilac, and cherry to the kindergarten at Hull House in February. We sorted them out, each in its own glass of water, looking well at them as I named them. Every morning some child was deputed to keep the water fresh, and we looked them over. The first hint of green appearing on the lilac was hailed as an event, and finally even the cherry bloomed long before there were any signs of green on the outdoor twigs.

These city children lived a quarter of a mile from a tree worthy the name, yet their interest grew keen in the pet twigs, and in March, when we made our first pilgrimage to the bare little square, by courtesy a park, the children scampered ahead and instead of frolicking on the grassplot, as in former trips, they all clustered around a forlorn syringa brush, peering into it as if some wonder hid therein. I thought it must be nothing less than a bird's nest. "Children, what have you found?" I called. "We're looking for the green leaf-buds," they shouted back.

I recognized in the answer an unconscious quotation from a song we sang,

> "God sends the bright spring sun,
> To melt the ice and snow,
> To start the green leaf buds,
> And make the flowers grow."

Just a little noticing, watering, an occasional painting of the twigs, and what a door had been opened leading to plant-life for Tony, Solly, Annunciata, and all the rest!

Finding that trees do blossom, we look later for blossoms on every tree, and find winged maple-keys, that flutter down and stick upright in the soft lawn, shy oak catkins that hide behind leaves of the exact shade of their own green, pussy willow that changes from gray fur coat to yellow powdered gown.

POND LIFE

When Helen and I sat on the porch one warm evening in late January we heard a soft croaking from the pond in the pasture lot. Could it be frogs singing their spring-song thus early? We must not let the time escape us for taking a dip-net and hunting for the jelly-like masses of frogs' eggs that I knew would soon after be found in clusters about the stems of rushes.

A glass jar makes a fair aquarium for a child, especially if some water weed can be put in it to supply oxygen for the animal life to breathe. Snails, tiny minnows, and water-beetles make a good beginning. Water must be changed daily by dipping out and gently pouring in fresh of the same temperature.

COCOONS

Happy is the child who has the privilege of seeing his own moth from his own cocoon. One day in April a big brown Polyphemous appeared on the study-shelf under the cocoon which had a hole in the end. He was too weak to fly and his downy velvet wings were wet and crumpled. We watched him slowly unclose and fan them to and fro, and at last he made a wavering flight to the window. A good model, he posed there for our painting. But he refused to uncurl a long tongue to suck up the honey as the brown butterfly did the drop I placed on my finger-tip last fall.

WHEN FRIENDS GET TOGETHER

GETTING UP A PARTY*

BY WILLIAM BYRON FORBUSH

A PARTY, as everybody knows, consists of two things—play and ice cream. This being so, we are surprised to be told that "parties are becoming obsolete." Surely there is no easier or better way of expressing neighborhood fellowship among children than by a party.

Since every game-book consists almost entirely of descriptions of games for parties, most of which are generally well known, this page shall be given rather to a few statements as to the technique of a successful party.

Every party should have a play-master, a cheery dictator who is supreme from the beginning to the end, and who has nothing to do with the refreshments or the cloakroom or anything but play-leadership.

The one essential preparation for a good party is a schedule, in which quiet games, for rest, alternate with active ones. Allowing ten minutes for each game, a dozen will be plenty for an afternoon.

CHOOSING GAMES

In choosing games, avoid those which require much apparatus or preparation, because children and young people are eager to get to playing. Avoid games which involve writing, reading, or reciting, any activity which may not be "pulled off" quickly and with unanimity, or any which will make conspicuous either the exceptionally forward or the backward friend. Avoid games in which knowledge of each other's names is essential, for some present will probably be strangers. Avoid games which encourage unmannerliness, rough handling, or the disposition of any one to be "fresh." It is possible to play the liveliest games courteously.

Choose games that are simple and easily explained. Do not be afraid of old games. Folks generally like to play the games they know best. At the close of each game ask if they wish to play it over, and if they respond enthusiastically, do so. Be sure that each game is suitable for the number present. Blind Man's Bluff, for instance, requires at least a dozen players to be enjoyable, but Tether Ball cannot be played by more than two at one time. Sometimes, at a large party, it is necessary to divide the players into two circles, but this is unsatisfactory, because chums get separated and those in one circle are quite apt to be sure that the other circle is having all the fun. If it is necessary to divide the players into two or more groups, assign a member to each group and arrange for the winners of each game to progress to the next circle. This shifting will make for better acquaintance among the guests. In games where the one who is "it" must be quick-witted, be sure the friend first chosen for that part is competent. If the leader is not sure, let him be "it" first himself.

The game chosen to begin the party should be one which can be played by a few, which does not require choosing up equal sides and which lends itself readily to the addition of more players as the late arrivals straggle in. Instead of an embarrassing sitting around on chairs, it is better to begin to play some jolly game as soon as half a dozen arrive. Then those who come afterward are drawn at once into an active, laughing company. Good games for starting a party are Buzz, Peanut Hunt, Racing to the Bell, Blind Bell, Horns, Fish Pond.

Among the active games those of hunting, chasing, and seeking are always popular. In the quiet games, guessing and imitating are well liked. All quiet and some active games are played in a circle, and if the room is large enough a circle of chairs

*Partly from "Manual of Play," by William Byron Forbush, published by George W. Jacobs and Company, Philadelphia.

should be placed in advance and kept for use as wanted. A piano adds to the pleasure and orderliness of a party, in the marching games, in changing from one game to another and to accompany the march to the refreshment room. Forfeits are always popular, but are not successful unless they are thought up in advance, are performed rapidly and are paid by all. Anyone who is visibly embarrassed in paying a forfeit or in playing any game should, of course, be released at once.

Prizes generally stimulate unpleasant motives and jealousies among children. Favors for all are better. Elaborate decorations are unnecessary and are usually unnoticed.

STUNT GAMES

On such an occasion some young man may carelessly take from his pocket a small box of friction matches with his right hand, remove a match with the same hand, light it on the box with the same hand, blow it out and replace it in the box without using his left hand. Then the practiced operator may ask somebody else to try to do it, and the fun will begin.

Or a young lady may stick a long pin into the floor and then hand three nuts to her neighbor, asking him to pitch them at the pin. The distance of the nuts from the pin will be carefully measured, and after several have tried, the one who succeeds in placing a nut nearest the pin will be the winner.

Again, a large-necked bottle is placed on the floor and each player is given five peanuts. The feat is to stand at arm's length from the bottle and, if possible, drop the five peanuts into it. Anyone will be lucky if he can succeed in putting in three of them.

Take five pennies or dimes in the palm of your right hand and manipulate the hand so as to get a penny on the end of each finger and the thumb; then, when all the ends are full, return them to the palm without dropping one.

Again, take five quarters and slip them between the fingers of one hand until they all lie on the back of the hand without using the other hand.

Somebody sits at the head of the room holding a large, deep dish heaped with peanuts. Each person, in turn, slips a hand, with the palm down, into the dish and scoops up as many nuts as possible on the back of the hand, the one holding the dish helping to add to the mass in every possible manner. The one who succeeds in walking across the room and back and depositing the largest number of peanuts in another dish wins the prize.

The Persistent Penny

Hold a couple of pennies between the finger-tips and the thumb in such a way that the under side of the lower coin points to the ground. Release the lower penny, letting it fall into the other hand, held a foot or so below it. The penny will turn over, showing what was the under side before release. If the distance be increased to a couple of feet, a complete revolution is made—that is, the penny comes to rest with the original side up. Therefore, by regulating the distance, one can make either "head' or "tail" show, and this greatly puzzles people who do not notice the change of distance.

The Looped Chains

A jailer who was instructed not on any account to let his prisoner go free, felt uncertain about the fastenings of the door and window of the cell. He, therefore, resolved to pass the night in the cell himself, and for extra security padlocked a chain on to his own wrists, first passing the chain *through* that which confined the prisoner's hands together. Nevertheless, when he woke in the morning the prisoner had disappeared, although he could not unlock his own chain, and that of the jailer had not been tampered with.

Let two members of the party try this experiment, with stout cords tied to their wrists representing the chains. If they cannot do it, take the place of one, and proceed as follows:

Pass the loop of your cord, without twisting it, under the cord which binds one of your jailer's wrists, from above; then slip it over his hand, and you will be free. You can make yourself a prisoner again by reversing the movements.

THE WITCHES' SCREEN

For an evening party, put up an old sheet in a doorway. Four holes are torn in it, and through these holes the following articles are passed to those on the other side, who are blindfolded: a hot potato, a raw oyster, ice, a snake made of dough, a potato filled with toothpicks, and a rubber glove filled with air and the open end tied together and dipped into ice-water. The blindfolded ones are to guess what these articles are.

A MAGAZINE PARTY

A Magazine Party is a splendid means of passing away an evening. The program may be varied, shortened or lengthened, according to time on hand. The names of the magazines may be acted or disguised in words, so as to give each member

of the party an opportunity to exercise the faculty for guessing and reasoning. Prizes may be awarded to those guessing the most and least numbers.

In conducting a party of this kind, provide a pencil and sheet of paper on which are written two rows of figures corresponding in number with the number of magazines to be guessed. Give each member one of these papers and a pencil. Have someone read the phrase that is the disguise of the first magazine. Call that Number 1. Tell each member to write opposite the figure one the disguise and the name of the magazine guessed. Go through the list in this way, then announce the correct names in the order given, and ask each member to check those guessed correctly, and write the number guessed on the edge of the paper. The prizes can then be awarded according to the best and worst guesses made.

The following is a specimen list of magazines and the disguises in which they may be presented. The disguises may be varied:

DISGUISE	REAL NAME
100 Years	Century
Santa Claus	St. Nicholas
Ancient Minstrel	Harper's
Public Place in Rome	Forum
Early New England Settler	Puritan
One Who Sketches	Designer
Noted Fairy	Puck
Large Body of Water	Atlantic Monthly
Dispenser of Justice	Judge
Prospect	Outlook
Boys' Jackknife	Youth's Companion
Part of Rope	Strand
Ever on the Move	American Boy
The Dark Night Songster	Black Cat
The Reader	Bookman
All the People	Everybody's
The New John Alden's Wife	Modern Priscilla
Picnic	Outing
The Sentinel	Watchman
Everybody's Job	World's Work

FAGOT PARTY

One of the most successful parties I ever conducted was a "Fagot Party." Forty children and young people had assembled one winter day in a living room 15 x 25 feet. Very active games were impossible. Each person present was given a fagot or small piece of wood, to which was fastened a number. As each responded to the order of his number, he was ordered to throw his fagot upon the open fire and to sing a song, recite a piece, tell a conundrum, or suggest a game, to last as long as his fagot burned. The whole afternoon ran rapidly away with this varied and self-originated program.

THE FINE ART OF LIVING TOGETHER

BY FRANK H. CHELEY

Lots of people think manners do not amount to much. They have an idea it is unnecessary to be polite. They're not using their heads. Just as oil makes an engine run more quietly and easily and efficiently, so do manners make your life and the lives of the folks with whom you come in contact run more quietly and pleasantly and efficiently. Good manners are a mighty valuable asset that anybody can have cheaply.

"There is something which you owe to everybody and which has no exact date when it must be paid, because it is due every minute and second of your life. You owe courtesy to the strangest people. Actually, you owe it to your brother and sister. It doesn't seem possible, but you do. And you owe it to your father and mother. You owe it to the ash man and to the washwoman. You owe it to the President of the United States and to the blind man who tries to sell you a lead pencil on the street corner. When you were born you gave the whole world a promissory note payable in courtesy, and you have to make it good every second of your life until you die. Do you know why people loved Abraham Lincoln so much? It was because he never forgot that he was paying his courtesy note," says *The American Boy*.

A certain Harvard professor, in lecturing to a class on the art of writing, said to them: "To write well you must first think of your subject; second, think of the people you are writing to; and last, think of yourself." These same simple rules may easily be made effective rules for one's manners also. First, think of the demands of true sympathy and kindness; second, think of the person you are addressing; and last, think of what is owing to yourself, for the real secret of good manners is a kind heart.

Not long ago a certain high school boy who was brilliant and clever and had great ability, desired to be elected president of his senior class—in fact he would rather be president of that splendid body of young folks than anything in the world. The nominating committee met, they considered his

name—yes, he would preside well, he could make a good speech, he groomed himself carefully, but —*he had no manners.* A fellow of much less native ability but who had learned a powerful secret was almost unanimously elected—he had early learned the secret of being polite to himself —of being so careful how he treated himself that treating other folks kindly and with consideration was a perfectly natural thing.

The story is told of a certain office boy who kept a whole, big, busy office happy and agreeable and kindly disposed toward one another by his habits of courtesy and good will. One day the boss wheeled suddenly in his big chair and said: "Bennie, who on earth taught you to be so polite? You often make me ashamed of myself."

Bennie smiled, grinned from ear to ear, stood on one foot a bit abashed, and then with a sudden inspiration replied:

"Well, sir, Mother is polite, Dad is polite, and —and, oh, I guess I just caught it from them."

Nothing in the world is so "catching" as good manners.

One of the surest of all tests of character is one's manners. You do not need to know people intimately to judge them accurately. All you need to do is to watch them a bit in action. If they are kind and sympathetic, if they are manly or womanly and honest and considerate, they will show these very qualities over and over again. Nothing is so difficult to successfully camouflage as bad manners, for they will show themselves at the most unexpected times and places. Manners, after all, are but the outside expression of what you are inside, and what you are inside *will* get out like the proverbial cat that is always coming forth just at the moment you most want him kept out of sight.

The value of good manners can scarcely be overestimated. Theodore Roosevelt once wrote to one of his sons, "My boy, study to be courteous." There is a pleasant and an unpleasant way to perform all the little duties of life. There is a fortunate and an unfortunate way of meeting folks, of rendering countless little services, of speaking, acting, thinking; therefore, study to be courteous in them all.

A young lawyer once asked an old and successful judge how he might improve his individuality and power.

The old judge replied like a shot—"Constantly examine your manners."

"Gentle manners bring to their possessor an influence which, though quietly exerted, is a power for usefulness in the world. In business, all transactions are helped by politeness; many men fail in life because their manner does not make a good impression, because their curtness and lack of good breeding repel others," some one has well said, and Dr. Weir Mitchell adds: "Good manners, tact, patience—these characteristics often assist men to win who are really inferior to some who, for want of these very qualities, miss the place they would otherwise attain."

YOUR FRIENDS

BY BENTLEY BATES

THREE men worked busily over a small camp fire, laughing and joking all the while. One was frying a steak.

"Smells just like it used to ten years ago," he laughed.

"You always *were* a real artist at steak," laughed the meat chef, "but any dub can fry a steak; it takes a real artist to cook biscuits in a frying pan, but then *you* always were a shark at biscuits. Mind the ones that you made that night we climbed the old Peak—I have never had their equal since."

"But the real test of a camp cook," spoke up the third man, "is in the coffeepot."

"You're just right," confessed the meat chef and the baker.

"It takes the coffee to make it all worth while, I say," added the coffee maker, and all three straightened up to wipe away the perspiration. They were having an hour of pure fellowship together. Pals they were—the real kind. They had not been together for ten years, but tonight those ten years seemed to be but a brief separation, for they were back in those wonderful days when boys do have *real* pals—pals that stick together through thick and thin; stand up for each other; fight for each other; take blame for each other and count it all joy!

Three boys they were with the same ideals and ambitions to accomplish worth-while things in the world. Each had succeeded in his chosen field and tonight they were back again to sit once more by the slowly dying embers to talk it all over, after the fashion of pals.

Three seasoned old friends, what an experience! what a luxury! what a possession! for, as Robert Hall has said, "a faithful and true friend is a living treasure, inestimable in possession, for he who has made the acquisition of a judicious and sympathizing friend may be said to have doubled

his mental resources." Life brings no blessing equal to true friendship.

Someone has voiced my sentiments when he said, "I would rather meet one of the fellows I used to pal with when I was a kid, than be invited to dinner by the President." Such are boy friendships, real, enduring, and tremendously worth while. Pity the boy or girl with no real friends!

As Jimmie says, "A friend is a feller who knows all about yer and likes yer just the same." "Do folks like *you?* That is a mighty important question. Or do they say, 'Here comes that Jones boy. He's an infernal nuisance.' Did you ever start out to make folks like you? If you are going to be successful and have friends, nothing will contribute as much to your success as the sincere liking of the folks you meet. Everyone should start a campaign to earn the liking of the people he encounters. It is easy. And it is a lot more pleasant than earning their dislike."

Emerson says: "To have friends you must be one. We take care of our health, we lay up money, we make our roof tight and our clothing sufficient, but who provides wisely that he shall not be wanting in the best property of all—friends."

If it be true that "acquaintances are the raw material from which are manufactured friends," how careful we should all be of our acquaintances, first that they be of the right sort, and second that we properly conserve them. On a simple little gravestone in a far western cemetery are inscribed these words—a whole biography of a long life is one inspiring sentence:

"He was rich in friends."

It is told of a certain great man that when asked to account for his wonderful achievements, he simply replied with a smile, "I had a friend who believed in me." It is one of life's choice gifts to have such a friend—there is only one thing finer and that is being such a friend yourself. "Be economical of your friends, don't waste them."

Most people are friendly, and it is only because certain kinds of friends may be a great misfortune to us that we need to consider what kind of friends are really worth the having. A man's or woman's whole career can very many times be explained perfectly, whether it is a great success or a miserable failure, by his or her friends. The great, irresistible, ever-working law of association, operating in life, says, "You are bound to become like the thing with which you intimately associate." If your friends are of the first-class, large-calibered type, with manners, character, and ideals, it makes it just that much easier for you to be just that sort of a person. If, on the other hand, your friends are petty, unclean, careless, and second-class, it will be only with the utmost difficulty that you will be able to retain your standards, if indeed you are able to at all. Therefore, choose for your friends and intimates those that are bigger and better and finer in at least certain qualities than you.

Confucius says: "There are three friendships which are always advantageous: friendship with the upright, with the sincere, and with the man of much observation." Therefore, let your friends be hand-picked, but be certain there is a great variety, too. Have young friends and friends your own age and old friends. Have boy friends and girl friends and men friends and women friends. Have dog friends, and bird friends, and wild friends, and flower friends, and book friends, and music friends—in other words, be truly, genuinely friendly; and, in the process, take time to get acquainted with yourself and to chum with *you,* for if you can really chum with yourself there will be little doubt about your being able to chum with others. If you loathe yourself and can't enjoy a quiet hour with your inseparable companion, the person in the looking-glass, then don't be surprised if the dogs run away and little children disappear and the old folks "freeze up" when you come 'round. You aren't fit to chum with. There is something wrong—you need repairs.

Seek always to be welcomed by good company, bearing in mind that "good company," as someone has well said, "is the society of those people who encourage us to take an intelligent interest in life."

There are some boys and girls who work hard because they want to increase their knowledge, who are keen on games and exercise, who read books, who study nature, and are able to talk about interesting things. "In all schools there is this little aristocracy of intelligence. Let it be your chief aim to become a member of it. Cultivate a contempt for anything base and ignoble. Cultivate a keenness for everything wholesome and intelligent. And when you have established yourself in this little aristocracy of intelligence, you will find yourself proof against evil influence.

"Be wise, and keep yourself clear of company which rouses your worst instincts, and makes you curious about subjects which intelligent people do not discuss. Cultivate your friends among the best people—people who read and think, who are too strong to be impure, and too conscious of the greatness of the beautiful universe to live petty, insignificant, and evil lives."

SOME SIMPLE RULES FOR CONVERSATION

BY SIR MATTHEW HALE

NEVER speak anything for a truth which you know or believe to be false. Lying is a great offense against humanity itself; for where there is no regard to truth there can be no safe society between man and man. And it is an injury to the speaker; for, besides the disgrace which it brings upon him, it occasions so much baseness of mind that he can scarcely tell truth, or avoid lying, even when he has no necessity for it. In time he comes to such a pass, that as other people cannot believe he speaks the truth, so he himself scarcely knows when he tells a falsehood.

2. As you must be careful not to lie, so you must avoid coming near it. You must not equivocate, or speak anything positively for which you have no authority but report.

3. Let your words be few, lest you rob yourself of the opportunity to gain knowledge, wisdom, and experience by listening to those whom you silence by your "impertinent talking."

4. Be not too earnest, loud, or violent in your conversation. Silence your opponent with reason, not with noise.

5. Be careful not to interrupt another while he is speaking. Hear him out, and you will understand him the better, and be able to give him the better answer.

6. Consider before you speak, especially when the business is of moment. Weigh the sense of what you mean to utter, and the expressions you intend to use.

7. When you are in company with light, vain, impertinent persons, let the observing of their failings make you the more cautious, both in your conversation with them and in your general behavior, that you may avoid their errors.

8. Be careful that you do not commend yourself. It is a sign that your reputation is small and sinking if your own tongue must praise you; and it is fulsome and unpleasing to others to hear such commendations.

9. Speak well of the absent whenever you have a suitable opportunity. Never speak ill of them or of anybody unless you are sure they deserve it, and unless it is necessary for their amendment, or for the safety and benefit of others.

10. Do not scoff and jest at the condition or natural defects of any person. Such offenses leave a deep impression.

11. Be very careful you give no reproachful threatening, or spiteful words to any person. When faults are reproved, let it be done without reproach or bitterness. Otherwise the reproach will lose its due end, and, instead of reforming, it will exasperate the offender and lay the reprover open to reproof.

12. If a person be passionate, and give you ill language, rather pity him than be moved to anger. You will find that silence or very gentle words are the best revenge for reproaches. They will either cure the angry man, and make him sorry for his passion, or they will be a sore reproof and punishment to him. But, at any rate, they will preserve your innocence, give you the reputation of wisdom and moderation, and keep up the serenity and composure of your mind.

THE ADVANTAGES OF THE VULGAR STORY

BY S. W. McGILL

IT ADVERTISES your ignorance.

It displays your lack of sense of decency.

It indicates the state of your inner character.

It exhibits the nature of your soul.

It shows your better self is being suppressed.

It illustrates the sordidness of your soul.

It typifies the meagerness of your sources of entertainment.

It proclaims the coarseness of your ideas of humor.

It tells the inadequacy of your means of expression.

It reveals the depths of defilement you have already reached.

It proves to your friends how greatly they may be disappointed in you.

It soils the imagination of your hearers.

It disgusts people of finer sensibilities who care for the clean and wholesome things of life.

It nauseates those who love fun but hate dirt.

It dishonors your parents and family and your friends and your home and your business and your God.

DOWN THE HILL WE FLY!
From the painting by Norman Price

Outdoor Games and Sports

THE WHEELBARROW RACE

The wheelbarrows are boys on their hands and knees.

They arrange themselves in a row on the lawn, with another boy standing behind each one.

When the signal to start is given, the boy who is standing takes hold of the ankles of the one

in front of him and lifts his knees from the ground, causing him to walk on his hands, at the same time pushing him forward.

The pair who first get past the winning-post wins the race.

THE CAT TIGGY

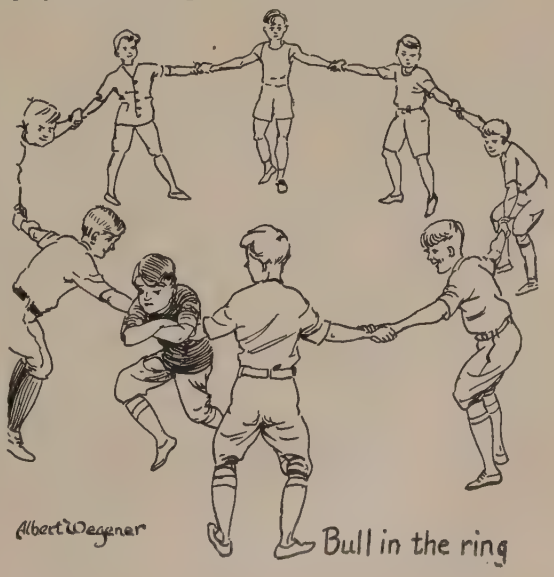
As soon as the players have agreed to play this game they cry: "The last perched is cat," at which every player tries to get a perch, that is, to get his feet off the ground. The players may stand on a piece of wood, sit on a gate, or, in fact, do anything so long as their feet are off the ground. The last perched is the cat.

The other players beckon to one another, changing places by signal, or going to new perches, and the cat has to touch them before they have perched themselves. If the cat should succeed in touching anyone who is off his perch, the player touched becomes cat.

He cannot touch the old cat until the latter has been perched once.

BULL IN THE RING

A boy is chosen to be "bull." The remainder of the players join hands and dance round him. The bull folds his arms, rushes at the circle, and tries to break through. If successful, the other players attempt to catch him; if he is caught, the player who caught him is "bull" next time.



EGG-CAP

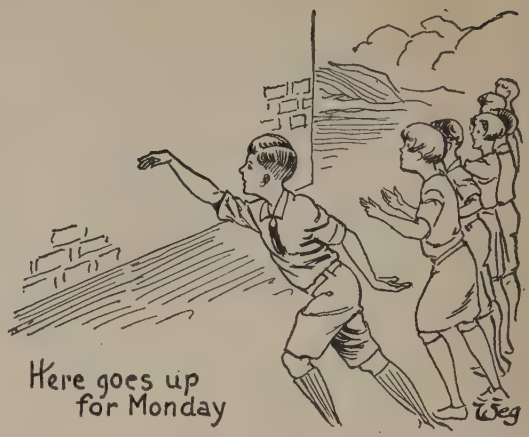
The players, who may number from three or four to twelve, arrange their caps in a row against a wall, and put three small stones, called "eggs," into each cap. A player is chosen to begin the game. He stands at a distance of about ten feet from the wall, and tries to roll a ball

into one of the caps. If he is successful, the boy into whose cap the ball has fallen must pick it out and throw it at the other players, who in the meantime have run away. If he hits a player, that one loses an egg, and must then roll at the caps.

If a player, when rolling, fails to get the ball into a cap, he loses an egg, and another player takes the ball. The last player having an egg left in his cap wins the game. When a player's eggs are all gone, he is out of the game, and must leave, taking his cap with him. Instead of using caps, holes may be dug in the ground, but it is, of course, more difficult to get the ball into a cap.

"HERE GOES UP FOR MONDAY"

This game is played by seven children, each taking the name of one of the days of the week. The players stand facing a high wall. Sunday takes the ball, and throwing it high against the wall, calls out: "Here goes for Monday" or "for Tuesday" or for some other day of the week and the player so named must try and catch it before it reaches the ground, the others meanwhile running away. If the ball is caught, it is thrown against the wall by the catcher, and he in his turn calls a name; when a player misses the ball he loses a point, or an "egg," as it is called. He must then pick up the ball and throw it at the other players,

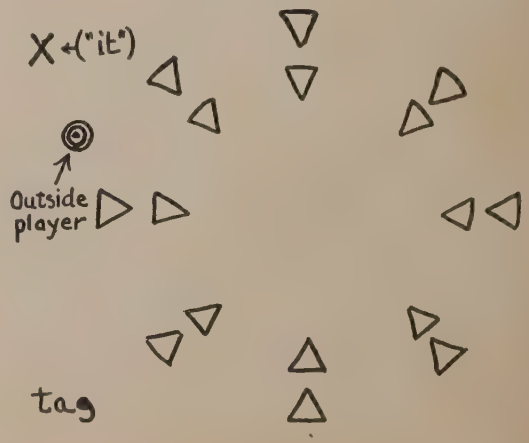


and if one is hit, that player also loses an egg, and has in his turn to throw the ball against the wall.

The player who, when throwing the ball at the other players, fails to hit one, must himself throw the ball against the wall. The loss of three "eggs" puts a player "out"; the last one having an egg left wins the game.

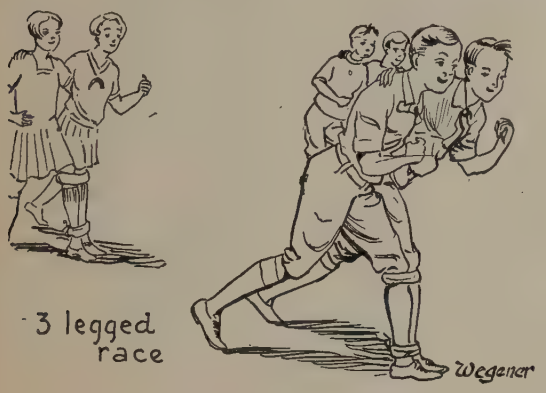
TAG

Eighteen persons are necessary to play this game properly. The players, except two, arrange themselves in a ring, two deep, leaving enough space between two pairs to allow a person to dodge between easily. The two players who are out of the ring are called the "it" and the "outplayer." The game is for the "it" to try and touch the "outplayer," who can dodge in and out or round the ring, and when he is tired or wishes to, he can stand in front of one of the pairs inside the ring, the outside member of which then becomes the "outplayer." If the "outplayer" is touched he becomes "it," and the previous "it" must take refuge in front of a pair, and so on.



THE THREE-LEGGED RACE

This race is run in couples, the right leg of one boy being tied tightly to the left leg of another at the thigh, knee, and ankle. The couple first



passing the winning-post win. It often happens that those who dash off to be first topple over, which enables a slower and surer pair to win the race.

THE MENAGERIE MAN

Each of the players, except two, takes the name of an animal, such as lion, leopard, panther, etc.; one of the two remaining is called the buyer, and the other the seller. The seller is supposed to own a menagerie, so he traces an imaginary cage upon the ground, and puts his beasts into it. The buyer then comes to the menagerie and pretends to knock at the door.

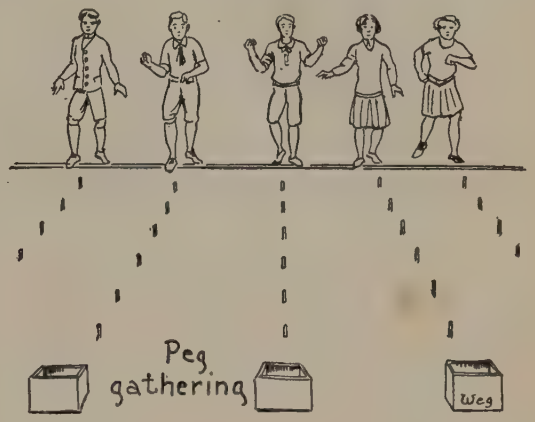
The seller asks: "Who knocks?" The buyer replies: "A merchant." The seller asks: "What do you want?" The buyer says: "To buy an animal." The seller then asks: "How much will you pay for it?" The buyer then mentions some price—say, ten dollars.

The seller then invites the buyer to enter, asking him at the same time what kind of animal he wishes to buy.

If an animal that the showman has is mentioned, he tells it to run out, at which it runs away from the cage. Before the buyer may run after it, he has to pay the price agreed upon, giving as many little taps on the hand of the seller as he has mentioned dollars. He then pursues the animal he has bought; if it can get back to the cage without being caught, it takes a new name; if, however, the animal is caught, the buyer pretends to cut off his ears, after which it is considered to be a dog. The dog or dogs have then to help to catch the other animals. The game ends when all the players have been caught and become dogs.

THE PEG-GATHERING RACE

A number of rows of pegs are driven lightly into the ground, one row for each player, sufficient room being left between the rows for a person to run up and down. A basket is placed at the end of each row, as in the diagram, the players standing at the opposite end. At the word "Go," the players rush to peg 1, pull it from the ground, carry it to the basket and drop it in, then run back to peg 2, and so on, carrying each peg



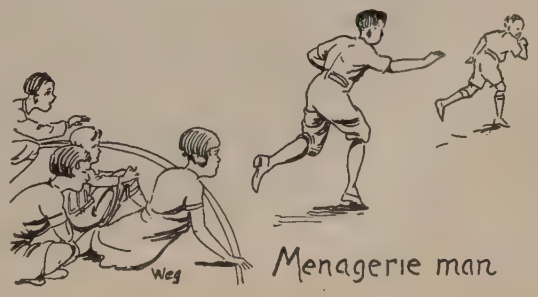
separately to the basket. The player who first puts all his pegs into the basket, and then gets back to the place he started from, wins the race.

Stones or potatoes may be used on the ground and used instead of pegs if these are difficult to obtain.

"I SPY"

This game is a mixture of Tag and Hide-and-Seek. The players divide themselves into equal sides, each side choosing a captain. The two captains decide which side shall hide first, helping their sides in hiding and seeking, by telling them good places, and so on.

The seekers mark out a base, and stay there with closed eyes or otherwise so that they cannot see where the hiders go to conceal themselves. The hiders give a whistle or shout to show that they are ready. The seekers then begin to look.



As soon as a hider is seen, the player who sees him shouts: "I spy," and all the seekers rush home, for on being called the hider must come out, and he must try to tag a seeker before the home is reached. A hider need not wait to be called, but can try to tag a seeker whenever he sees a chance. The seekers should never pass a place where there is the least chance of anyone being hidden, for if they are cut off from home they are sure to be caught. If the seekers are successful in spying out the hiders without being caught they go out to hide, but if most of the seekers are tagged the hiders go out again.

WIDDY-WIDDY WAY

This game is sometimes known as "Warning." A "home" is marked out against a wall. One of the players is chosen to be the "leader," and begins the game by taking his place in the home. As soon as the "leader" is ready he claps his hands together, kicks the wall, shouts: "Warning!" and starts in pursuit of the other players as in Tag, except that his hands must not be unclasped. If the "leader" unclasps his hands he cannot touch any player till he has gone home and started afresh. If the "leader" can be caught as he returns, he must give the one who caught him a pick-a-back or ride home.

As soon as the "leader" touches a player, the two rush home to avoid giving pick-a-backs. After joining hands, kicking the wall, and shouting: "Warning!" as before, the two start together in pursuit of the others; in this way the game goes on, player after player getting caught, and having to join the chain. The players who are still free try to break the chain without being touched in order to get a ride home and to put off the time when they must themselves be caught, for as soon as the chain is broken the players composing it must run home.

If the playground is a small one it is best to arrange for a "widdy of six"; that is to say, when six are caught they must go in pursuit together, but the next one caught must start a fresh "widdy." This prevents the chain getting so long as to stretch right across the ground and so to make dodging impossible.

HARE AND HOUNDS

Hare and Hounds is a good country game. Two children, who should be not necessarily the best runners, but the liveliest dodgers of the party, represent the "Hares," and the remainder are the "Hounds." The hares carry with them bags full of paper torn up in very small pieces, which they scatter behind them as they run, to act as scent. By this the hounds track and endeavor to capture them. The hares, of course, try to mislead them by all sorts of doublings and twistings, or by going over difficult country. The hares are not allowed, by the rules, to make false starts at any part of the run, or to separate and lay two scents. They are considered caught if the scent gives out.

The hounds will find a little discipline a wonderful help to them in baffling the tricks of the hares. A captain and whipper-in should be chosen, the former to head, the latter to look after the stranglers if there happen to be any. So long as the scent is strong the whole pack simply follows the captain, keeping well together, but when he is not sure of his way, he blows the whistle which he carries, and the pack halts. The whipper-in stands at the last point at which the scent can be seen, holding a handkerchief in his hand. The pack run round and examine the ground to find the lost scent. The moment they find it the captain blows his whistle and they go off again.

Instead of scattering paper the hares may use a piece of crayon or a broken flower pot and mark an arrow or an X to show which way they went.

SNOW GAMES

It is very easy for boys and girls to invent snow games for themselves; but a few hints as to how to set about it may be useful.

First and foremost it should be remembered that snowballs should not be weighted with stones or heavy substances, which render them dangerous missiles instead of harmless and amusing ones.

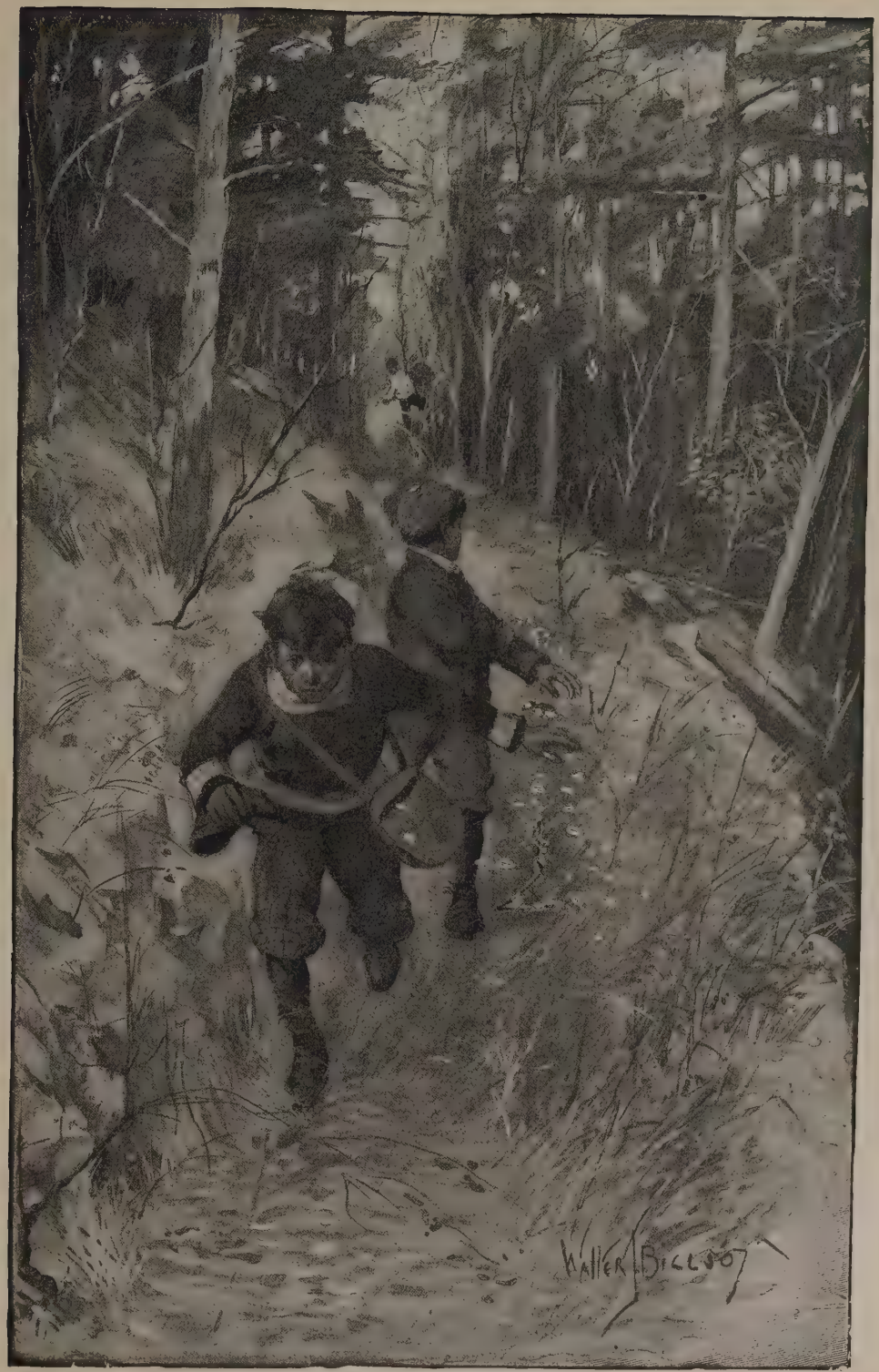
Freshly-fallen snow should be chosen, and before the game commences, the players should be divided into sides and each side should employ all its members to make snowballs as fast as they can. It is very unfair for the elder members to set the little ones to this work, while they are enjoying the fun of aiming the balls.

The side which works the quicker naturally has the larger supply of ammunition and stands a better chance of winning.

Lines should be drawn between which the combatants stand to fight, and whichever side drives the other side over the line is counted victor.

JACK, JACK, THE BREAD BURNS

Two of the players represent a Master baker and his man Jack; the remainder of the boys seat themselves on the ground, one behind the other, and hold each other tightly round the waist. These are supposed to represent loaves of bread. Suddenly the Master cries out "Jack, Jack, the



HARE AND HOUNDS

bread burns," and he and his man rush at the loaves and try and detach the first loaf. If they succeed the loaf becomes theirs and is placed in the "shop" (a certain spot chosen previously) for sale, there to await other loaves. The chief thing for Jack and his Master to do is to take the loaves unawares. If, however, the foremost loaf succeeds in catching either Jack or the Master and holding him so tightly that he cannot get away, the one caught must become a loaf, but goes to the rear as soon as it is decided he is fairly caught. The game continues either until all the loaves are caught or until Jack and his Master are caught.

BUCK, BUCK, HOW MANY FINGERS DO I HOLD UP?

Three boys play this game, Master, Buck, and Frog. Buck places himself against a wall, bends his back, supporting himself by placing his head against the master's stomach. The master is supposed to render Buck as much assistance as possible.

The Frog leaps upon Buck's back and asks him —"Buck, Buck, how many fingers do I hold up?" at the same time holding up some of the fingers of his right hand. If Buck guesses correctly, he is at once released, if not Frog asks him again and again until the right number is guessed when Buck becomes Master, Master becomes Frog, and Frog becomes Buck.

THE SERGEANT

One of the players is chosen as sergeant and takes his station upon a spot from which he is not allowed to move. The remainder range themselves in a line in front of the sergeant, and are bound to carry out his instructions. His commands never exceed two: "Do as I do," and "Do not laugh." This sounds very simple, but as the sergeant makes the most absurd postures he can think of, and which his soldiers are bound to copy, it is very seldom that all obey the second command "Do not laugh." Whenever a soldier laughs he is turned out of the ranks.

AUNT SALLY

This is such an old and popular game that it will need very little description. To be correct Aunt Sally should have a negress' head adorned with a turban, and a smart gown covering her wooden body; between her lips is fixed a short clay pipe. But anyone can rig up an Aunt Sally for himself: An ordinary block of wood, the upper part of which may be painted to represent a face will serve equally well. A hole must be bored in the wood where the lips are painted, so that the pipe may be made fast.

The players take up their stand at twelve or twenty yards from the figure, the distance being agreed upon between the players and marked out. Upon this mark the players take their stand armed with a short thick stick. Each one endeavors to throw the stick in such a way that Aunt Sally's pipe is knocked out of her mouth.

For every time this occurs the player scores a point.

The player who gains the most points wins the game.

HIDE-AND-SEEK

All the players hide except one, who stays at the point called home, with his eyes hidden, and counts to a number previously agreed upon. The hiders separate and hide in various places. When the Seeker finishes counting he calls out: "Coming, ready or not," and then starts to find the others. The hiders must try and get home without being caught by the Seeker. If they can manage this they can all hide again, if not the first one caught must become Seeker.

FIVES

In this game the players take turns to hit a ball with the hand above a line marked on a wall; sometimes bats are substituted for the hand.

MARBLES

The best method of shooting a marble is the following: Bend the thumb at the first joint and grasp it firmly with the middle finger. Place the marble above the thumb and hold it in position with the first finger, then suddenly, having taken good aim, let fly the thumb and the marble will be shot forward with considerable force.

At the finish of every game of marbles, marbles must be distributed to their original owners. We play games for the fun to be had, and not for material gain. "Playing for keeps" is poor sportmanship.

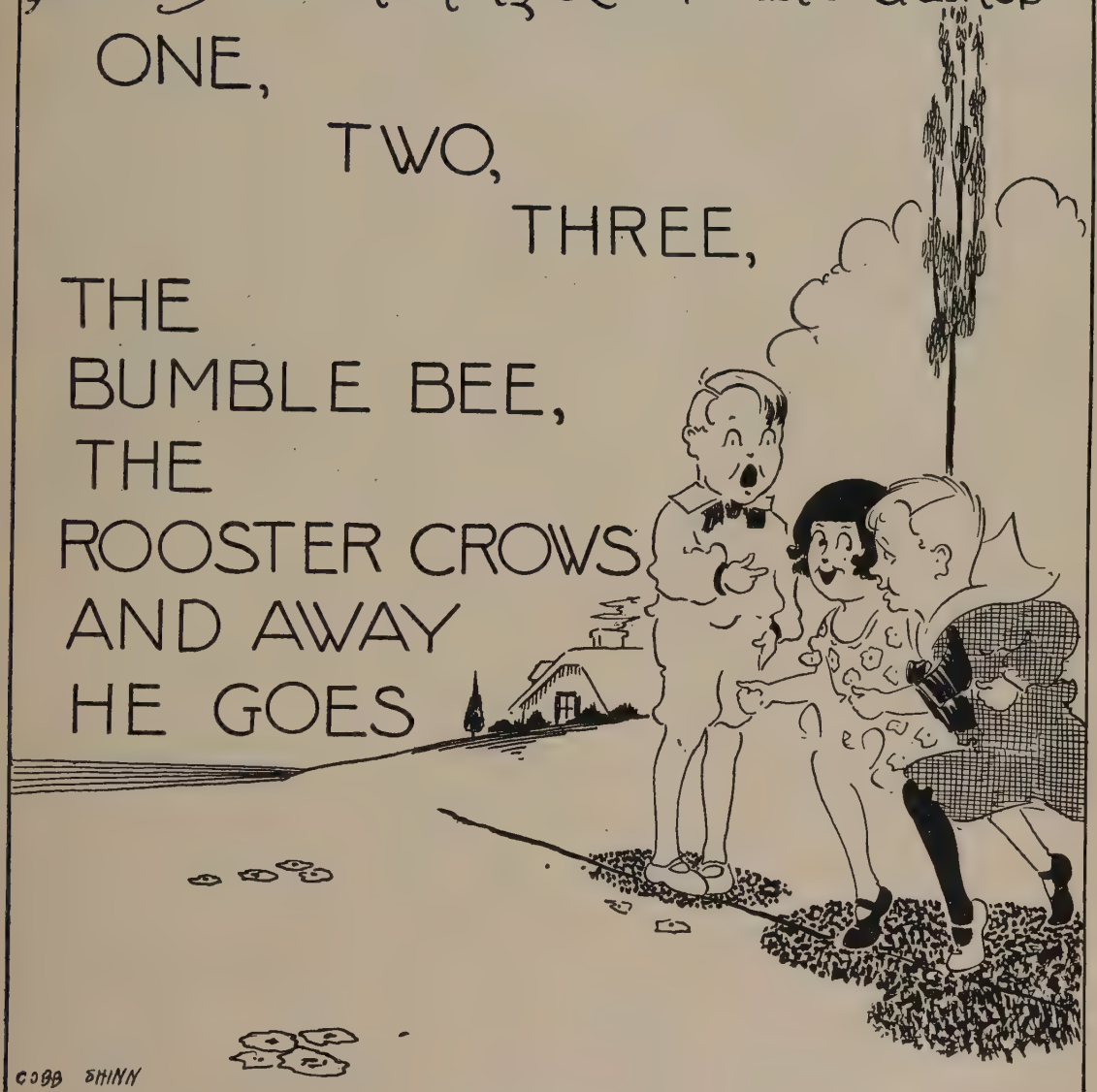
Bounce-Eye

A circle, about a foot in diameter, is made on the ground; every player subscribes a marble to make a pool, and these marbles are placed in the center of the circle.

The players draw lots to decide the order in which they shall play. The first player takes a marble between his first finger and thumb and holding it near his eye takes aim at the center

A JOLLY OLD RHYME to USE for Starting Races and Games

ONE,
TWO,
THREE,
THE
BUMBLE BEE,
THE
ROOSTER CROWS
AND AWAY
HE GOES



COBB SHINN

of the marbles and lets the one he is holding drop.

As many marbles as he can scatter outside the ring he may claim for his own; but if he does not succeed in putting any outside the ring the one he made the attempt with must remain forfeit to swell the pool.

When all the marbles in the pool have been won the game is ended and the marbles distributed to their original owners so that a new game may be started.

Handers

A small hole is made in the ground about a foot from a wall, or background of any kind. The players decide the order in which they shall play by each rolling a marble toward the hole and then fixing the order by playing according to their position, those nearest the hole playing first and so on. The players then subscribe so many marbles each and the first player takes the whole of them in his hand and rolls them towards the hole.

As many as fall into it he claims for his own; they must fall straight in, any that rebounds into it from striking against another marble do not count.

Then the next player takes the remainder of the marbles and tries his luck, then the third, fourth, and so on. When the marbles are all used up, or very much reduced in numbers, a fresh supply must be subscribed for, so that every player may try his luck. Of course at the close of the play the marbles are distributed to the original owners.

Three Holes

Three holes are made in the ground, each of them being about an inch deep and two inches in diameter. They should be about a yard apart, either in a line or any other position; but they must be numbered 1, 2, and 3. A starting line two yards from the nearest hole is fixed and the first player aims for hole 1.

If he succeeds each of the other players must give him a marble and he may then try for hole 2, and again hole 3 if he is so fortunate. Each success entitles him to another shot.

If the first player fails to make the first hole, or having made that misses another, his "taw" or marble must remain on the ground. The other players are then allowed to aim at it and take another stroke off it; if they succeed, the owner of the taw must ransom it by an ordinary marble. No taw may be hit more than once by the same player.

One Hole

Either a cap is placed upon the ground or a round hole is dug, it does not matter which. Each player takes ten marbles in his hand and tries to throw the whole of them into the cap or hole. He reclaims all that go in, but leaves those that fall outside where they drop.

The players throw in turn; any player who gets the whole ten marbles into the cap takes the marbles that are lying around.

Knock Out

The players draw lots for the order in which they shall play. A line is then drawn two yards from a wall. The first player takes a marble and rolls it against the wall, the second follows suit and then the rest. Any one of them whose marble in the rebound strikes another marble may claim all the marbles on the ground.

If a ball rolls over the line it must be replaced on the line at the point it crossed it.

Long Shooter

This game is for two players only. The first player places a marble on the ground, the second places another two yards off in a line with it. At two yards' distance from the last marble the first player shoots another, which is generally a prize marble or shooter. If he hits the marble nearest to him he pockets it and has a shot at the next, which he may also pocket. Then the marbles are set again and the second player tries his luck.

If the first player should miss, the second player may aim at all three of the marbles on the ground, including his opponent's shooter.

Picking the Plums

Two straight lines are drawn parallel to one another, from four to eight feet apart. Each player places two or three marbles, which are called "plums," upon one of the lines, leaving about an inch between them. The players in turn "knuckle down" at the other line and shoot at the "plums," those hit being kept by the suc-

cessful shooter, but a second shot is not allowed till the next round.

If a player fails to hit a "plum," he must add one to the row to be shot at.

Ring Shooter

This game is somewhat like the previous one. A circle about a foot in diameter is drawn on a piece of smooth ground or asphalt; each player puts an agreed-on number of marbles in the circle, as nearly as possible at equal distances from one another. Around this ring another must be drawn at a distance of from six to seven feet.

The first player starts from any point on this line, and shoots at the marbles in the inner circle; if he knocks one out and it goes outside the larger ring he takes it, and may shoot again from the place where the marble he originally shot with stops, and may continue to shoot until he fails to knock a marble out.

Whenever a player fails to knock a marble from the circle his own marble must remain where it stops, unless it rolls out of the outer circle, in which case he may pick it up. The players follow one after the other, keeping the same order throughout the game, one succeeding another as soon as he fails to knock a marble from the ring.

The marbles that have been shot and which remain in either of the rings are treated in the same way as the marbles originally put in the small ring.

The game goes on until both rings are clear.

Pyramids

The marbles for making a pyramid are supplied by one boy, who charges one marble a shot to every boy who wishes to play. A ring a foot in diameter is drawn upon the ground, and in the center three marbles are placed, arranged in a triangle, with a fourth on the top of them, forming a pyramid. Any marbles knocked out of the ring become the temporary property of the shooter, who also retains the marble he shot with, even if it remains in the ring, should he knock one out; but if his marble stops in the ring without knocking another out, it is claimed by the owner of the pyramid.

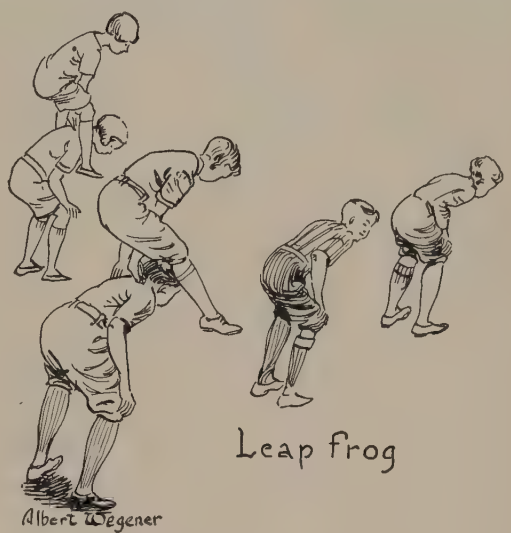
The players shoot in rotation whether they win or lose. The pyramid must be remade each time it is knocked down.

Spanners

This is a good game for two players only. The first player shoots a marble, and the second tries to shoot his marble against or within a span of it. The players shoot alternately, but when one is successful he has another shot, and the other player pays him a marble.

LEAP-FROG

This is the simplest and at the same time one of the best of overback games. The players stand behind each other, forming a long line; the first player in the line makes a back, the second leaps over, and makes a back a few feet farther on, the first one still remaining down. The third player goes over first one and then the other, forming another back in the same manner as the second,



and so on until all the line are down. Then the boy who made the first back starts again, and leaps each of the backs and makes another back at the end, the next player does the same, and thus a continually advancing line of backs is formed.

If the players are anxious to get over the ground quickly they can run a dozen yards or so before "going down." The whole fun of the game lies in its being played smartly and with spirit.

FLY

In this game a leader and a boy to make first back are chosen. The leader does some trick as he leaps the back, which the other players must exactly follow; any player making a mistake takes the place of the one who is giving the back.

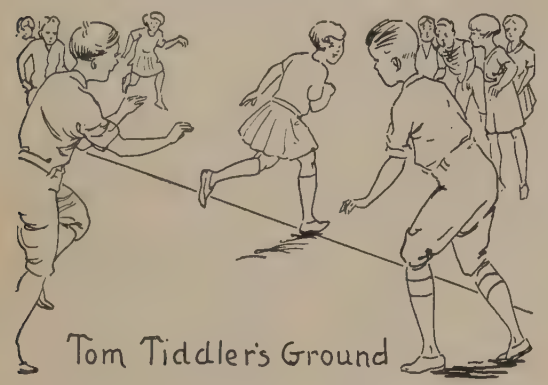
The variations are almost numberless, but one or two may be mentioned. For instance, to fly the back with the left hand only, or to place a

cap on the back as you leap and pick it off before touching the ground.

The back as soon as released takes the place of the leader, who becomes second player.

TOM TIDDLER'S GROUND

A line is drawn to separate Tom Tiddler's Ground from the rest of the playground or field. Tom Tiddler takes up his position in this space and tries to touch anyone who intrudes upon it. Any player he touches becomes a prisoner and must stand behind Tom Tiddler until a comrade



comes to rescue him. To release the prisoner, the rescuer must touch him without being previously touched by Tom; if, however, Tom touches the rescuer first, he also becomes a prisoner. The whole spirit of the game lies in there being plenty of invaders, and in the prisoners being rescued quickly.

RING O' ROSES

This is a game for very little children. They form a circle holding hands, and walk round singing the following verse:—

"Ring-a-ring o' roses,
A pocket full of posies,
Hush-a, hush-a, we'll all tumble down."

When they sing, "We'll all tumble down," over they go, roly-poly on the grass. Then they get up again, and the game begins afresh.

TOP GAMES

To spin a top, take a stout piece of string with a knot about an inch from an end. To the other end fasten a metal button. Unravel the end of the string below the knot and slightly wet it. Take the top in the left hand and lay the wetted end of the string along the top, just above the peg, and hold it tight with the thumb. Now take the string in the right hand and wind it round the top. When you have wound up all the string put the button between the middle and third fingers, place the thumb under the peg and the first and middle finger on the top.

Take care to keep the string tight. Hold the top high above your head, throw it from you with a bold swing, and you will find the top will spin well.

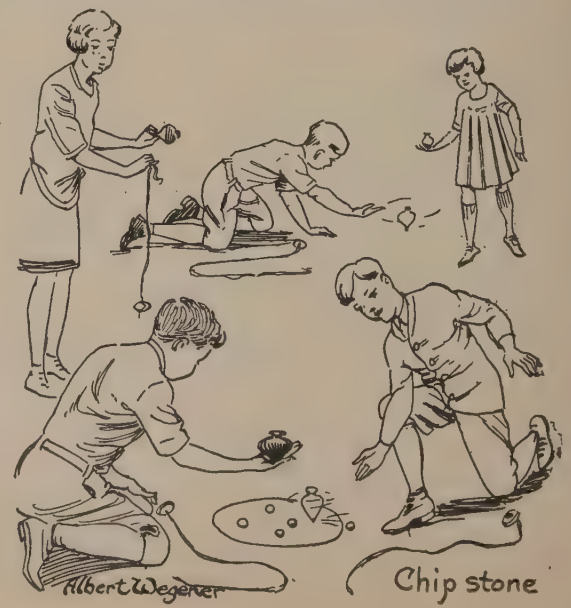
Peg in the Ring

The best game with peg-tops is "Peg in the Ring." A large ring, a yard in diameter, is marked, with a smaller one, a foot in diameter, within it.

A player begins the game by spinning his top in the smaller ring; the next "pegs" at it. If a top when it stops spinning remains in either of the circles it must be placed "dead" in the inner one for the other players to peg at; if, however, it rolls clear, as it should do if well spun, the player spins it again. Every player spins again as soon as he can get his top, and is allowed to peg at every top, dead or spinning, within the inner ring.

Chip-Stone

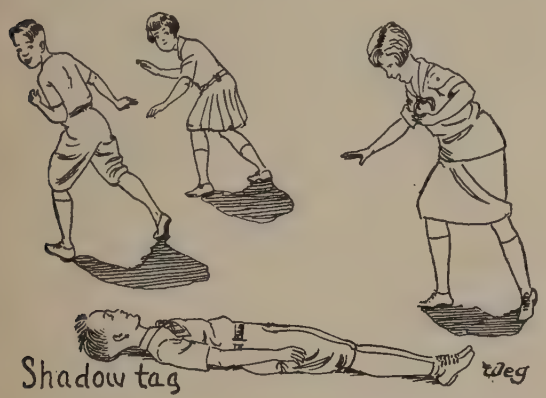
This is another very good game with peg-tops. A small ring, a foot in diameter, is drawn upon the ground, into which each player puts a marble. "chipping," to knock marbles out of the ring. The players spin their tops outside the circle, pick them up in their hands still spinning, and try, by slipping the tops out of their hands, or



any marbles "chipped" out become the temporary property of the player knocking them from the ring.

SHADOW TAG

One player is chosen to be "It." He tries to step on the shadow of another player. If he succeeds, he calls the name of the player, who then becomes "It."

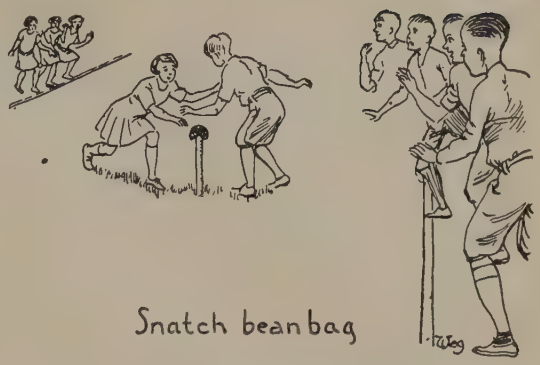


To prevent his shadow from being stepped upon a player when hard pressed may bend in various directions or even lie down.

SNATCH THE BEAN BAG

The players are divided into two equal groups in the usual way. Two parallel lines are drawn in the ground about fifty feet apart. At a point half way between these lines a flat-topped stake is driven into the ground and on top of it a bean bag is placed.

Each group of players is lined up behind one of the parallel lines so that the first player in one group faces the first player in the other group with the bean bag on the stake between them. At a signal the first player in each group runs out and tries to get the bean bag and return with it to the goal line before being tagged by his opponent. A player who succeeds in doing this makes his opponent a prisoner. A player who is tagged after he secures the bean bag and before he reaches the goal line becomes a prisoner of the other side. One or the other of the two opponents, then, must become a prisoner. In every case it is the object of both opponents to get the bean bag and return with it to the goal line without being tagged by the other player. Much cleverness may be used in trying to do this. Effort should be made to pit players against each other who are as nearly equal in ability as possible. To this end, the leader on one side may first range his players side by side in the order in which they are to play and then the leader



on the other side should arrange his players to the best advantage in the order in which they are to play.

The game ends when all the players on both sides have played once. The game is won by the side which has the most prisoners.

FOX AND GANDER

A player is chosen to be the fox. Another player, the gander, heads a line of players, the geese, who stand behind him, each one with his hands on the shoulders or about the waist of the players immediately in front of him.

The fox shouts, "Geese, geese, gannio!"

The geese shout back, "Fox, fox, fannio!"

The fox then says, "How many geese have you to-day?"

The gander replies, "More than you can take away."

The fox then tries to tag the last goose in the line; the gander, with hands outspread, and the line of geese by bending the line hither and thither try to prevent it. When the goose at the end of the line is tagged (no other goose may be

tagged) he becomes the fox and the fox becomes gander.

Chinese and Japanese boys play the same game but call it "The Wolf and the Serpent."

ADVANCING STATUES

The object of this game is to teach children alertness and self-control.

The children stand on a line about thirty feet from the teacher or some older pupil who acts as leader. When the leader faces them they are to remain motionless as statues, but when his back is turned they may advance. By turning

unexpectedly at irregular intervals the leader seeks to catch the children in motion. A child detected in motion must go back to the line and start over again. The child first crossing the line on which the teacher stands is the winner.

Variation.—The leader counts ten before turning. The counting may be fast or slow, regular or irregular.

ALL-UP RELAY

Behind a starting line drawn on the ground the players are arranged in two or more single files (one behind the other in each file), there being a like number of players in the different files. Directly in front of each file, and at a distance of from twenty to fifty feet from it, two circles are drawn, each three feet in diameter and with rims touching. In one side of each pair of circles three Indian clubs (or billets of wood of equal diameter and height and sawed off square at the ends) are placed on end.

At a given signal the foremost player in each file runs forward and with one hand lifts the clubs or billets, one at a time, and sets them down in the adjoining circle so that they stand erect and do not touch the circumference of the circle. This done he hastens back to his file, touches the outstretched hand of the next player (the file having moved forward so that the player to be touched off toes the starting line), and takes his place back of the line. The instant the second player has been touched off he runs forward and

sets up the clubs or billets in the other circle. He then runs back and touches off the third player, and so each player in turn runs forward as he is touched off by the preceding player and moves the clubs from one circle to the other. That file wins whose last player first crosses the starting line on his return.

Variation.—A cap or other object is laid upon the ground about thirty feet in front of each file. The players, each in his turn, run around the object and from one to three times, as agreed upon, then return and touch off the next runner.

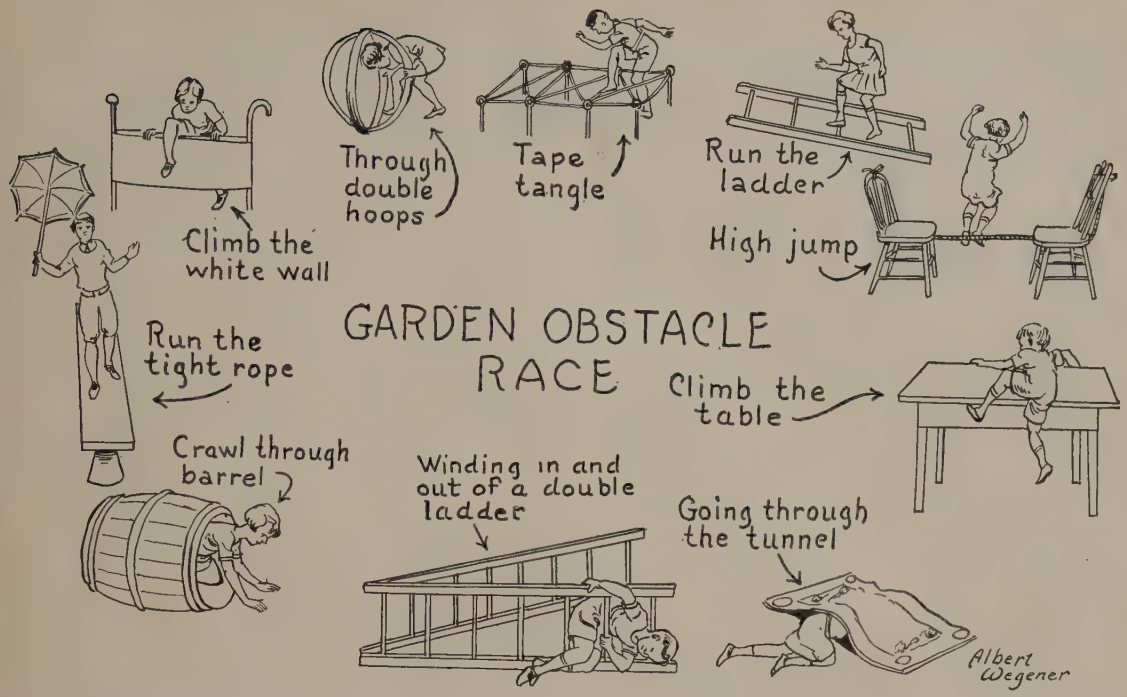
ANIMAL BLINDMAN'S BUFF

A circle of players is formed and they dance around a blindfolded player who has a cane in his hand. When he taps on the ground or floor or claps his hands three times, the players come to a stop. He then points to some player who must take hold of the end of the cane. The blind man then asks him to make a noise of some animal, say a dog, cat, cow, or horse. The one making this noise should try to disguise his voice as much as possible. The blind man tries to guess who makes the noise, and if right they exchange places. In either case the circling about goes on as before.

Players may disguise their height by bending the knees, standing on tiptoe, or in other ways.

A GARDEN OBSTACLE RACE

A garden obstacle race for children is really amusing, and makes an excellent impromptu entertainment.



A sufficiently exciting course may be made with the help of the most ordinary accessories to be found in the house or garden in the space of half an hour, the course being laid out on the lawn, or any other wide space of turf, or in the corner of a field.

The difficulty of the various obstacles to be surmounted should vary, to a certain extent, according to the average age of the guests, though a small, lithe, active boy of seven or eight will often beat competitors of ten or twelve years old.

Collect together a dozen long, iron meat skewers, a clothes-line, or skipping-rope, a bundle of white tape, an old traveling-rug, an empty barrel with both ends knocked out and all protruding nails carefully removed or hammered flat, so that there are no sharp points sticking out anywhere, a long single ladder, a double ladder, if there happens to be one in the garden, a couple of big flower-pots, a long, narrow, springy plank, two big wooden hoops, a small roller-towel, a couple of walking-sticks, and a strong, four-legged table, besides a piece of wide white tape to act as starting-point and winning-post.

Have these accessories piled in the middle of the chosen course, and arrange them into obstacles, laid out in a large circle or oblong, from five to ten yards apart, in the following way:

1. *Winding In and Out of a Double Ladder.* The double ladder is laid on its side and opened for a couple of feet at the free end, and pegged down to the ground to prevent its overturning. Competitors must wind in and out between the rungs from one end to the other.

2. *Going Through the Tunnel.* The tunnel consists of a traveling-rug firmly pegged down at the four corners, underneath which the competitors have to crawl. (N.B.—A wide fold of a couple of feet at least must be made in the rug lengthways before pegging it down, in order to leave space for the children to crawl through. If it were pegged out flat, no one could get under it.)

3. *Climbing the Table.* The table is placed as an obstacle over which each competitor must climb.

4. *The High Jump.* This consists of two garden chairs, placed four feet apart, with a clothes-line or long skipping-rope tied to the back of each and brought under the seats and across the intervening space to form the jump. The seats must face each other, as this prevents them from toppling over.

5. *Running the Ladder.* The narrow ladder is laid flat on the ground, and the competitors have to run along it without missing a rung or losing their balance.

6. *The Tape Tangle.* For this obstacle, which, if properly arranged, is one of the best of the set, the long, ring-topped, metal skewers must be stuck into the ground to stand six inches above it,

and about thirty inches from one another, in two parallel straight lines a yard apart. A criss-cross of white tape is made by passing it across and across from ring to ring. Competitors have to pick their way from end to end of the entanglement without being tripped up.

7. Getting Through the Double Hoops. The hoops are passed one inside the other in such a way that they make a skeleton ball, and are first tied top and bottom with a piece of twine where they intersect each other, and then pegged down into the ground. Each competitor has to crawl in and out of the ball.

8. *Climbing the White Wall.* The white wall consists of the roller-towel stretched out to its longest extent, with the walking-sticks passed through either end of it to keep it upright. Each competitor must climb over this.

9. *Running the Tight-rope.* The two flower-pots are inverted at such a distance apart as to just support the ends of the springing plank. Each competitor must run along the plank from end to end, and it adds to the general excitement if one or two Japanese umbrellas are provided, and if each competitor is forced to stop, pick up an umbrella from beside the plank, and, opening it, run the plank with it held over his or her head like a true tight-rope walker.

10. *Crawling Through the Barrel.* The barrel is laid on its side, and each competitor must crawl through it before running on to breast the winning tape. This is more difficult than it sounds, because the barrel, not being pegged down in any way, is apt to roll round and round with a competitor inside it before he or she can succeed in getting through. For a big party, as this is the last obstacle, two or three barrels may be arranged in a row, and this adds greatly to the general excitement, for the competitor who first succeeds in successfully negotiating the barrel is practically certain of winning the race, and the sight of several barrels rolling about madly, with frenzied arms and legs waving from either end of them, provokes a very gale of merriment from the spectators.

A two-yard length of broad, white tape, held between a couple of "grown-ups," makes the starting-post and winning-post.

To start the obstacle race, when all the children have assembled, arrange them in a line, five yards behind the starting-point, and standing one behind the other according to ages, the youngest in front and the eldest at the back of the line.

The starting-rope is now raised, to make a low jump for the small child who has to start the race, and is raised an inch or two for each competitor until it becomes quite a good jump for the biggest boys and girls to negotiate as a start.

The time-keeper now cries, "One, two, three—go!" and off dashes the smallest child of the party, who, being a nimble little person, in spite of her minute size, has wound in and out of the ladder and is well on toward the rug tunnel before No. 2, who is nearly a year older, gets his start. The time-keeper counts ten for each year of age, consulting a card upon which names and ages have been noted, and then cries "Go!" until, in this way, all the competitors have been fairly started.

The course consists of two laps—that is to say, the entire circle of obstacles must be negotiated *twice;* and it is only after the second time of passing through the barrel that each competitor makes for the winning-tape, which is held taut and breast high to receive each runner in true professional style.

The obstacle race in full swing is a most exciting spectacle—two children are struggling underneath the rug tunnel, one is balanced on the ladder, which is not nearly so easy to run as it looks at first sight. The tight-rope is bouncing and threatening to throw the big boy and girl who are balanced at either end of it at any moment—luckily the drop is not a high one, a foot or so at most. A big boy lies in the middle of the tape tangle, laughing helplessly where he tripped up, and five or six competitors are scrambling over the table, one or two of whom slide over it to land upon their heads, while a line of several frenzied and shouting children are crouched down behind the barrel, which twists and wriggles as if possessed, while four arms and legs fitfully emerge from either end, denoting that the block has been caused by two very slim, six-year-old boys, who just managed to dash into one end of it together, and then got jammed and unable to move either way. A good pull from a "grown-up" finally releases them, and off they dart, none the worse, round the course for the second time.

HOW TO PLAY FLAGS

Any number of players from three to six a side can take part, and the only accessories actually required are two large white pocket-handkerchiefs—to represent flags—and a dozen medium-sized stones or pebbles.

To begin the game, the players choose sides, and divide the lawn into two camps, separated by a boundary line.

Each party has a flag and six stones (or soldiers) to place upon it.

The flag is placed at the extreme back of the

camp, at the part farthest away from the boundary line, and behind this any prisoners captured during the game must stand until they are rescued.

The object of the game is for each of the players on either side to dart over the boundary line into the enemy's territory and make a dash for one of the stones, to be brought back in triumph.

A player holding a stone thus captured in her hand claims safe transit back to her own country. If caught *before* she has captured a stone, she is taken prisoner, and must stand behind the flag with hand outstretched to await a rescue.

The next player who succeeds in reaching the flag will touch her hand to rescue her, instead of stealing a stone, and hand in hand rescued and rescuer can cross the enemy's country in safety in order to return home.

The excitement of the game as one or other side succeeds in capturing two or three prisoners who, although on *parole* not to set foot over the back boundary line behind the flag, skip and dance behind it, waving their hands and imploring to be rescued, can be better imagined than described. If one or two "grown-ups" have consented to join in the fun, the effect of seeing their mother or a good-natured but too venturesome uncle imprisoned behind the enemy's flag leads the juvenile players to perform unheard-of feats of foolhardy valor in their efforts to reach and free them.

The defenders often succeed in capturing these would-be rescuers one after another, until the proud moment arrives when every single member of the enemy's forces is captured and ranged in a row among the prisoners, and nothing remains but to take leisurely all their stones and capture their flag before their eyes, before declaring victory.

In order to win a game of flags, however, it is not necessary to first capture the whole of the opposing forces. The only essential is that the winning side should have rescued any members of its side who may have been taken prisoners, and have captured all the enemy's stones, and, lastly, its flag, in order to give a victory, when the game can begin over again.

CRAZY CROQUET

"Crazy croquet," as its name implies, is a game which breaks every known canon of croquet law and horrifies the serious croquet enthusiast. It can be played upon a proper lawn, with the hoops and sticks set up in regulation fashion; but it can also be played just as well in quite a small garden, where the available turf is cut up with flower-beds, in which case the hoops are set up promiscuously wherever a convenient spot presents itself, while the sticks are set up to make variety about the course, which must be arranged in such a way that the players can go through the hoops and hit the sticks without having to cross a gravel path, which would much damage the paint on the balls.

"Crazy" though the game may appear to the player of ordinary croquet, a definite set of rules has been laid down, which all players must follow:—

No. 1.—The ground must be so laid out that the course begins with a hoop, which each player must go through before proceeding elsewhere.

No. 2.—The order of playing is the same as that employed in ordinary croquet: blue, red, black, yellow.

No. 3.—Any number of players may take part in a match, but from four to eight players make the best game, each player playing for herself. No partners are allowed.

No. 4.—Each player starts from a spot two mallets length away from the first hoop, which must be gone through by each player before he or she can go on elsewhere about the ground.

No. 5.—Each player has one stroke only for each turn, except after having struck another ball. Going through a hoop or hitting a stick does not entitle the player to a second stroke.

No. 6.—No player may hit his or her ball until the previous player's ball has come to rest.

No. 7.—When a player has been through the first hoop she may proceed to any part of the ground during her next turn, hitting any stick or going through any hoop she pleases. Going through a hoop or hitting a stick scores one, and a hoop may be approached from either side; but it is forbidden for a player to go through the same hoop or hit the same stick in two successive turns.

No. 8.—A player may strike any other player's ball, and, having done so, appropriates her opponent's score—should it amount to fewer than ten—and is then entitled to take another stroke.

No. 9.—The object of the player with the highest score (under ten) is to avoid the neighborhood of other players' balls until she has succeeded in compiling a score of ten. She is then allowed to put this first ten aside, and set about securing a second ten, to be put aside in the same way, until the full score fixed upon before the commencement of the game—30, 40, or 50, according to the time on hand—is reached, when victory is declared.

Photographed by H. Armstrong Roberts

CRABBING IS FUN

WISHES AND CHARMS

RHYMES USED BY CHILDREN IN MANY LANDS

Rain, rain, go away,
And come again another day.

Rain, rain, go to Spain;
Fair weather, come again.

Cushy, cow bonny, let down thy milk,
And I will give thee a gown of silk:
A gown of silk and a silver tee,
If thou wilt let down thy milk to me.

Now, gentle flower, I pray thee tell
If my lover loves me and loves me well;
So may the fall of the morning dew
Keep the sun from fading thy tender blue.
Now I number the leaves for my lot.
He loves me not. He loves me. He loves me not.
He loves me. Yes! thou last leaf, yes!
I'll pluck thee not for the last sweet guess.

An even-leaved ash,
And a four-leaved clover,
You'll see your love,
'Fore the day is over.

A clover, a clover of two,
Put in your right shoe,
The first young man you meet,
In field or lane or street,
You'll have him or one of his name.

Burnie bee, burnie bee,
Tell me when your wedding be?
If it be to-morrow day,
Take your wings and fly away.

Friday night's dream on a Saturday told
Is sure to come true, be it ever so old.

Evening red and morning gray
Set the traveler on his way;
But evening gray and morning red,
Bring the rain upon his head.

In the morning when you rise
Wash your hands and cleanse your eyes.
Next, be sure you have a care
To disperse the water far;
For as far as it doth light,
So far keeps the evil sprite.

—*Robert Herrick.*

Matthew, Mark, Luke, and John,
Bless the bed that I lie on!
Four corners to my bed,
Five angels there lie spread;
Two at my head,
Two at my feet,
One at my heart, my soul to keep.

The following rhyme refers to the "gifts," or white spots on the nails, beginning with the thumb, and going on regularly to the little finger:

A gift—a friend—a foe—
A visit to pay—
A journey to go.

Tread, tread the green grass,
Star, star, star;
Come on, you pretty, fair maid,
And walk along with me.
If you be a fair maid,
As I suppose you be,
I'll take you by the lily-white hand,
And lead you across the sea.

He—The moon shines bright,
May I see you home to-night?
She—The stars shine, too,
And I don't care if you do.

From witches, warlocks, wurricoos,
Evil speerits,
And
A' things that gang bump! i' the nicht—
Guid Laird deleever us!

—*A Scotch Child's Prayer.*

FLOWER ORACLES

I. For a Husband.

Rich man, poor man, beggar-man, thief,
Doctor, lawyer, Indian chief.

II. For the House.

Big house, little house, pig-sty, barn.

III. For the Wedding Dress.

Silk, satin, calico, rags.

IV. For the Bridal Carriage.

Coach, wagon, wheelbarrow, chaise.

Lilies are white,
Rosemary's green;
When you are king,
I will be queen.

Roses are red,
Lavender's blue;
If you will have me,
I will have you.

The rose is red,
The violet's blue,
Pinks are sweet,
And so are you.

COUNTING-OUT RHYMES

Onery, uery, ickery, Ann,
Fillison, follason, Nicholas John,
Queevy, quavy, Irish Mary,
Stingalum, stangulum—buck!

Onery, uery, ickery, see,
Huckabone, crackabone, tillibonee;
Ram, pang, musky Dan,
Striddledum, straddledum, twenty-one.

Ena, mena, mona, mite,
Pasca, laura, bona, bite,
Eggs, butter, cheese, bread,
Stick, stock, stone, you're dead.

Intry, mintry, peppery corn,
Apple-seed and apple-thorn!
Wire, brier, limber, lock,
Three geese in a flock,
One flew east, one flew west,
One flew over the cuckoo's nest.
You're he!

A, B, C, D, E, F, G,
H, I, J, K, L, M, N, O, P,
Q, R, S, T,
U are—out!

1, 2, 3, 4, 5, 6, 7,
All good children go to heaven.

1, 2, 3, 4, 5, 6, 7, 8,
All bad children have to wait.

INDOOR GAMES

THE GAME OF CAT

The person who is to play the part of Cat should stand outside the door of the room where the company is assembled. The boys and girls, in turn, come to the other side of the door and call out "miaou."

If the Cat outside recognizes a friend by the cry, and calls out her name correctly in return, he is allowed to enter the room and the latter then takes the place of Cat.

If, on the contrary, the Cat cannot recognize the voice, he is hissed, and remains outside until he is able to do so.

KALEIDOSCOPE

Four or more of the players stand in front of the rest, who are seated. Each player who is standing is given the name of some city so that those who are seated may know what city each one represents. Those seated close their eyes or, better, turn about and look the other way. The ones standing then rearrange their line so that each player has a new position. Those seated now open their eyes and (one at a time) are asked to name what city each one represents. This will serve as a test of observation and memory.

Instead of names of cities, the names of countries, lakes, rivers, or other names in geography may be used. Names in history, names of authors, titles of books, names of birds, and of other objects in nature study or other branches are also available. However, only one class of names should be used at a time.

CONSEQUENCES

One of the most popular games at a party is certainly "Consequences." The players sit in a circle; each person is provided with paper and pencil, and is asked to write on the top—(1) one or more adjectives, then to fold the paper over, so that what has been written is hidden. Every player has to pass his or her paper on to the right-hand neighbor, and all have to write on the top of the paper which has been passed by the left-hand neighbor (2) "the name of the gentleman"; after having done this the paper must again be folded and passed on; this time must be written (3) one or more adjectives; then (4) a lady's name; next (5) where they met; next (6) what he gave her; next (7) what he said to her; next (8) what she said to him; next (9) the consequence; and lastly (10) what the world said about it.

When every one has written what the world says, the papers are collected and one of the company proceeds to read out the various papers, and the result may be something like this:

(1) The horrifying and delightful (2) Mr. Brown (3) met the charming (4) Miss Philips (5) in Westminster Abbey; (6) he gave her a flower (7) and said to her: "How's your mother?" (8) She said to him: "Not for Joseph;" (9) the consequence was they danced the hornpipe, and the world said: (10) "Just what we expected."

WHO IS HE?

One of the players describes some celebrated person by giving traits in his character, personal appearance, etc. For instance, he could say: "He was a mighty hunter, a forceful ruler, was noted for his smile, wore remarkable collars, is dead." The audience would have little difficulty in recognizing Theodore Roosevelt. The players are only allowed one guess each, for every other guess they must pay a forfeit.

THE FARMYARD

This game, if carried out properly, will cause great amusement. One of the party announces that he will whisper to each person the name of some animal, which, at a given signal, must be imitated as loudly as possible. Instead, however, of giving the name of an animal to each, he whispers to all the company, with the exception of one, to keep perfectly silent. To this one he whispers that the animal he is to imitate is a donkey, or perhaps a rooster.

After a short time, so that all may be in readiness, the signal is given. Instead of all the party making the sounds of various animals, nothing is heard but a loud bray or cock-a-doodle-doo from the one unfortunate member of the company.

A PEANUT-HUNT

As the name of this game suggests, the object is to gather peanuts which have been hidden in every available nook and corner, in crevices of sofas and chairs, under bric-à-brac, on mantels, behind doors, etc. When it is thought that the hunting has continued long enough, the hunters are recalled to the room from which they started, the peanuts are counted, and a prize is awarded to the hunter having the largest number of peanuts.

HUNT THE RING

This game is played by all the boys and girls standing up in a circle, with the seeker inside. The ring is slipped on a long piece of thin cord or twine, the ends of which are then tied together. Each one in the circle holds this cord with one hand and passes the ring along it with the other. The game is to pass the ring along while the seeker is looking another way. The ring may be hidden by holding the hand over it till there is a chance to pass it on. The ring must not stay in one place, and when it has been found the one who held it must take the place of the seeker.

THROWING LIGHT

Two players secretly choose between them a word that has two meanings, such as "Ball"—a thing to play with, and "Ball"—a dance. They then begin talking to one another aloud, referring to the word without using it. One will say: "I played with it in the garden this morning." "Yes," says the other, "and a friend of mine went to one last night."

Those listeners who think they have guessed what the word is may join in the conversation, but must pay a forfeit if mistaken.

HISS AND CLAP

This is an excellent party game. One of the company goes out of the room, while the remainder of the players decide among themselves which of them he shall kneel to. When this is settled upon, the person who is outside is allowed to enter, and he kneels in front of the player he thinks is the right one. If he should make a correct guess, the company clap their hands, and the person to whom he knelt goes outside. If, however, the guess is incorrect, the company hiss loudly, and the guesser has to go outside, come back, and try again. Of course, it will make more amusement if when a boy is sent out of the room a girl may be chosen as the person to whom he has to kneel; and the opposite if a girl be outside.

WORD-MAKING

Near the top of a slip of paper each player writes down a word given out by the leader of the company. Then all start to make a list below it of other words, spelled from the letters it contains—and these letters only. When the leader says that time is up (about ten minutes should be allowed), the lists are added up, and the player who has made the largest number of words is the winner. It is not necessary to choose a very long word, for it is surprising how many words may be made from the letters contained in any word of ordinary length. For example, from the word "animal" we can get: am, nail, main, lain, and so on.

BRIDGE-BOARD

Here is an indoor game of marbles that can be played on any smooth floor. The bridge consists of a narrow piece of board in which nine arches have been cut. If this is not easy to get, place books with narrow openings between them for the "arches."

The arches should be about an inch in height and a little less than an inch in width.

Numbers are placed over the arches, but it is better not to place them in consecutive order—they might be—1, 5, 0, 6, 2, 4, 0, 3, 0.

One of the players becomes bridge-keeper, the others take turns to aim at the bridge. If a

marble passes under one of the arches the player who aimed it claims the number of points marked over it from the bridge-keeper. If he fails to shoot through an arch one point is lost.

The bridge-keeper should be changed every round.

THE MINISTER'S CAT

This game is very similar to that of "I love my love." Each of the players must describe the minister's cat, going right through the alphabet to do so. "The minister's cat is an *angry* cat," says one; "an *anxious* cat," says another; and so on until every one has used an adjective beginning with "A." Then they take the "B's." "The minster's cat is a *big* cat," and so on. The leader of the game must see that no one hesitates for a word. If any one should take longer than half a minute he must pay a forfeit.

TEN-WORD TELEGRAMS

One of the players calls out that a telegram of ten words has to be sent off describing, let us say, an election, a concert, or a ball-game, and the words must begin with certain letters. He mentions ten letters of the alphabet which he has chosen, and each player puts them down on a slip of paper. Five minutes are given for the writing of the telegrams, and when the time is up they are all read aloud. Clever players sometimes make very funny telegrams, and a great deal of fun can be got out of the game. A prize can be given for the best telegram.

TWENTY QUESTIONS

One person goes out of the room and the rest of the players choose a subject which he must guess by asking not more than twenty questions, but each question must be so put that it can be answered by "yes" or "no."

If he cannot guess it he must pay a forfeit and go out of the room again; but if he guesses correctly he receives a good mark for every question under the twenty which he might have asked. For instance, if he guesses the subject after asking ten questions he receives ten marks; if he has asked fifteen questions he receives five good marks. The player who receives the greatest number of good marks has won the game, and receives the prize if one is given.

BUZZ

This game is always a great favorite. The more players, the greater the fun. The players sit in a circle and begin to count in turn, but when the number 7 or any number in which the figure 7 or any multiple of 7 is reached, they say "Buzz," instead of whatever the number may be. As, for instance, supposing the players have counted up to 12, the next player will say "13," the next "Buzz," because 14 is a multiple of 7 (twice 7); the next player will then say "15," the next "16" and the next would of course say "Buzz" because the figure 7 occurs in the number 17. If one of the players forgets to say "Buzz" at the proper time, he is out. The game then starts over again with the remaining players, and so it continues till there is but one person remaining. If great care is taken the numbers can be counted up to 70, which, according to the rules before mentioned, would of course be called Buzz. The numbers would then be carried on as Buzz 1, Buzz 2, etc., up to 79, but it is very seldom that this stage is reached.

THE GAME OF SHADOWS

For this game you require a white sheet to be hung up at the end of the room. Then the "shadow-makers" take up their places on low stools behind the sheet; there must be only one lamp in the room, which should be placed about six or seven feet behind the "shadow-makers." Then the "shadow-makers" drape themselves with shawls, or anything handy, and take their places so that their shadows are thrown upon the sheet. They must of course try to disguise themselves, so that the "shadow-seekers" may not be able to guess their identity.

By loosening the hair and letting it fall over the face, a girl may appear like a man with a beard; bending the finger over the nose gives one a very queer-looking hooked nose in the shadow, and entirely alters the appearance of the face. Covering one's self up in a sheet and then extending the arms, gives one the appearance of a large bat.

As soon as a "shadow-maker's" identity has been guessed, he must take his place as a "shadow-seeker," and the one who guessed him becomes a "shadow-maker." The penalty of a glance behind on the part of the "shadow-seeker" is to pay a forfeit.

THE JOLLY MILLER

The players decide among themselves which one of their number shall act the part of the Jolly Miller. This being done, each little boy chooses a little girl as a partner; the Jolly Miller having taken his stand in the middle of the room, they

all commence to walk arm-in-arm round him, singing the following lines:

"There was a jolly miller who lived by himself;
As the wheel went round he made his wealth;
One hand in the hopper, and the other on the bag;
As the wheel went round he made his grab."

At the word "grab" all must change partners, and while the change is going on the miller has the opportunity given him of securing a partner for himself. Should he succeed in doing so, the one left without a partner must take the place of the Jolly Miller, and must occupy the center of the room until fortunate enough to get another partner.

BUBBLE-BLOWING

THERE are few prettier pastimes than this. We fill a bowl with fairly warm water, and throw into it about a teaspoonful of parings from common soap. Then we stir it with a stick; and the thinner the parings are the quicker they will melt. When there is a fair show of bubbles and suds, we get a clay pipe and dip the bowl of it into the water, but only so as to collect suds. Then we turn it upside down and blow very gently through the stem. A beautiful bubble will slowly grow at the mouth of the pipe-bowl and presently fly softly away, the secret being *not to blow too hard*. If there is a light wind at the time, our bubbles will rise into the air, showing on their sides all the colors of the rainbow. It is not necessary to have an actual clay pipe for bubble-blowing, as almost any small piece of tube will serve the purpose.

A good bubble game is played as follows. Put a woolen blanket over a long table. Have the sides of the blanket raised so as to form a sort of wall. When the bubbles are blown and tossed on the woolen blanket they will not break. With a fan, urge them from one end of the table to the other, and the person showing the most skill is, of course, the winner.

CHECKERS

THIS is a capital game and one very easily learned. It is played upon a checker-board with thirty-two white and thirty-two black squares.

To play the game, two persons sit opposite to each other. The players have each a set of twelve pieces, or "men," the color of the sets being different, so that the players can distinguish their own men easily. The men are round and flat and are usually made of boxwood or ebony and ivory, one set being white and the other black.

Before placing the men upon the board, it must be decided whether the white or the black squares are to be played on, as the whole twenty-four must be put on one color only. If the white squares are selected, there must be a black square in the right-hand corner; if the black squares are to be played upon, then the right-hand corner square must be a white one.

The movements in checkers are very simple: a man can be moved only one square at a time, except as explained hereafter, and that diagonally, never straight forward or sideways. If an opponent's man stand in the way, no move can take place unless there is a vacant square beyond it, into which the man can be lifted. In this case the man leaped over or "jumped" is "taken" and removed from the board.

The great object of the game, then, is to clear the board of the opponent's men, or to hem them in in such a way that they cannot be moved; whichever player hems in the opponent or clears the board first gains the victory. As no man can be moved more than one step diagonally at a time (except when taking opponent's pieces) there can be no taking until the two parties come to close quarters; therefore the pushing of the men continuously into each other's ground is the principle of the game.

In beginning the game, a great advantage can be obtained by having the first move; the rule therefore is, if several games are played, that the first move be taken alternately by the players.

When either of the players has, with his men, reached the extreme row of squares on the opposite side (the first row of his opponent) those men are entitled to be crowned, which is done by placing on the top of each another man, which may be selected from the men already removed from the board. The men so crowned are called "Kings" and have a new power of movement, as the player may now move them either backward or forward, as he wills, but always diagonally as before.

The Kings having this double power of movement, it is an important point for a player to get as many men crowned as possible. If each player should be fortunate enough to get two or three Kings the game becomes very exciting. Immediately after crowning, it is well for a player to start blocking up his opponent's men, so as to allow more freedom for his own pieces, and thus prepare for winning the game.

It is the rule that if a player touch one of his men he must play it. If a player A omit to take a man when it is in his power to do so,

his opponent B can huff him; that is, take the man of the player A off the board. If it is to B's advantage, he may insist on his own man being taken, which is called a "blow." The usual way is to take the man of the player A who made the omission, and who was huffed, off the board.

It is not considered right or fair for any one watching the game to advise what move be made, or for a player to wait longer than five minutes between each move.

Great care should be taken in moving the men, as one false move may at any time endanger the whole of the game.

With constant practice any one can soon become a very fair player, but even after the game has been played only a few times it will be found very interesting.

DOMINOES

THERE are several ways of playing dominoes, but the following game is the most simple.

The dominoes are placed on the table, face downwards, and each player takes up one, to decide who is to play first.

The one who draws the "stone" or domino with the highest number of pips on it takes the lead.

The two stones are then put back among the rest; the dominoes are then shuffled face downwards, and each of the players chooses seven stones, placing them upright on the table so that each can see his own stones, without being able to overlook those of his opponent.

As there are twenty-eight stones in an ordinary set, there will still be fourteen left from which to draw.

The player who has won the lead now places a stone face upwards on the table. Suppose it is double-six, the other player is bound to put down a stone on which six appears, placing the six next to the double-six. Perhaps he may put six-four: the first player then puts six-five, placing *his* six against the opposite six of the double-six; the second follows with five-four, placing his five against the five already on the table; thus, you see, the players are bound to put down a stone which corresponds at one end with one of the end numbers of those already played. Whenever a player has no corresponding number he must draw from the fourteen that were left out for that purpose. If, when twelve of these fourteen stones are used up, he cannot play, he loses his turn and his opponent plays instead of him. The two remaining dominoes must not be drawn.

When one of the players has used up all his dominoes, his opponent turns up those he has left, the pips are then counted, and the number of pips is scored to the account of the player who was out first.

If neither player can play, the stones are turned face upwards on the table, and the one who has the smallest number of pips scores as follows:—If the pips of one player count ten and those of the other player five, the five is deducted from the ten, leaving five to be scored by the player whose pips only counted five.

The dominoes are shuffled again, the second player this time taking the lead, and the game proceeds in this way until one or the other has scored a hundred, the first to do so winning the game.

This game is generally played by two only, though it is possible for four, five, or even six to join in it; but, in that case they cannot, of course, take seven stones each, so they must divide the stones equally between them, leaving a few to draw from, if they prefer it; if not, they can divide them all.

THE GAME OF FIVES

THIS is another game that is played with dominoes, and it is very popular. Two, three, or four players may take part in the game. If two or three play, each may take seven dominoes, or "stones." If four play, each may take only five stones.

In beginning, place the double-six on the table. The object of the game is to make as many multiples of five as possible, by adding together the end numbers of the line of dominoes; and if adding the twelve on the double-six will help in making a larger multiple of five, this may always be done.

For example: Suppose that A and B are playing. A draws the following stones: five-two; blank-one; blank-four; three-four; blank-two; double-four; five-six. B draws blank-three; one-three; blank-five; two-three; double-blank; four-six; one-two.

The double-six being placed, A plays the five-six, which scores five; B adds six-four on the other side of the double-six, and as the two end numbers, four and five, make but nine, B scores nothing. Then A adds the double-four (which counts as eight) and this, with five at the other end, makes thirteen. Now let us take advantage of the double-six, or twelve, and we have twenty-five—a fine score. B then plays blank-five, so the end number is eight, but using the twelve once more, twenty may be placed to B's

credit. A next plays blank-two, which means a gain of ten. B plays two-three, which counts nothing. Next, A plays blank-four (placing it next to the double-four) and his score is now fifteen, for though the ends only amount to three, the middle twelve makes it fifteen. Next B plays the double-blank, and his score, also, is fifteen. A plays blank-one, which counts nothing as the end numbers only amount to four. Next B plays one-two, which counts him five. A plays two-five, which, using the twelve, counts twenty. B plays blank-three which gains him five. As A has neither a five nor a blank he is compelled to draw a stone from the unused pile, and he draws blank-six—which, by placing next to the double-six in the middle, gains him five. As B has neither a five nor a blank, he too must draw. He secures and plays one-six and places it at the other end of the double-six, but it counts nothing, for the end numbers are now six. A must draw again, and he secures two-four which cannot be played, so he must draw still another. This time three-five is drawn and played, but no gain results. Then B plays his last stone, one-three; and though he gains nothing in counts, yet, being the first "out," he may count the spots or "pips" on A's remaining dominoes. They number thirteen; but as the game is "fives" he may claim the nearest multiple of five, which is fifteen. At the end of the game A has won eighty and B has won sixty. The game may consist in reaching any number decided on—two hundred being a favorite goal. Instead of building out on two sides of the double-six, it is allowable to build out on both ends also, if possible. This makes great fun, for instead of adding two end numbers there may be three or even four to be added. In this way one may, by a single play, earn a higher score. Once in a long time the four end numbers may add up as much as twenty-eight. This is a piece of rare good luck, for if the middle twelve be added, the score is forty—the highest number that it is possible to win at once. And when this happens, the fortunate player is then and there declared the winner of the game, no matter how the scores may stand.

GAMES WITH BEAN-BAGS

Bean-bags should be made of strong bright-colored material, six by eight inches in size. Half fill the bag with dried beans and overhand the top. Or, cut two circles six or seven inches in diameter. Sew together on the wrong side with a seam one-fourth of an inch. Then cut in the center a small circle an inch in diameter. Turn the odd-shaped bag inside out, fill very loosely with beans and overhand the small circular opening with close, strong stitches. These bags can easily be caught by very little hands.

There are several games to play with bean-bags. In one, the children stand in a circle with one in the center who throws the bag to each in turn all around the ring, or else tries to catch a player napping by throwing it to someone out of turn.

This may be varied by having children stand in a row when the leader throws to each in turn. Or, children stand in opposite rows and every one in one line has a bag which all throw in unison to the child opposite. These, in turn throw back in perfect rhythm. Vary again, by tossing into the air in unison.

Another bean-bag game, for older boys and girls, is played in this way. Get a thin board or a heavy piece of pasteboard three feet long and two feet wide. In this cut five holes, each six inches square. Place a number beside each hole—10, 20, 30, 40, 50. Then raise one end of the board about 9 inches, by placing it on a pile of books, a footstool, or the round of a chair.

Standing ten or twelve feet from the slanting board, armed with six bean-bags, let each player in turn try to send the bean-bags through some of the five holes. Each player may claim the numbers through which the bags fall. Thus, if two went outside the board, two through the hole marked 10 and two through 30, the player's score would be 80. Sometimes 10 is deducted for every bag that falls on the floor without going through a hole. When this game is played by small children they should stand nearer the board. The board should be very smooth so that the bean-bags will slip easily through the holes or even over the edge of the board, if the player is unlucky enough to miscalculate the throw.

BACHELOR'S KITCHEN

All the players sit in a row, except one, who inquires of each person what he or she will give to furnish the Bachelor's Kitchen. Each one answers by naming some article that might find place in a kitchen—but no two may be alike.

The questioner then begins with the first player, and puts to him all sorts of questions, to which he may reply only by the repetition of the name of his contribution. The object is to make the players laugh—which subjects them to a forfeit; as does also the addition or substitution of any word to their chosen answer.

What was the W then?
A whale, a wee worm, or a wren?
Or a witch of the wood
With a wonderful hood,
Who winked at a whimpering hen?

AN EXCHANGE PARTY

EVERY guest brings four or five little neatly wrapped and tied bundles. The more misleading in shape as to contents the better. The packages may contain anything from candy to soap, starch, tea, book, handkerchief, sunbonnet, etc., the more absurd the funnier. Each person recommends his or her own bundles, describing the contents wittily, and in a way to deceive as much as possible. The bargaining becomes very shrewd and merry until all the parcels have been exchanged, often more than once. Then they are opened, the best bargain winning first prize, the poorest compelling the holder to tell a story, suggest a game, sing or recite for the entertainment of the company. The universal verdict—"no trouble and lots of fun!"

A GUESSING-CONTEST

A GAME that requires but simple preparations and that rarely fails to amuse is a guessing-match. Arrayed upon a table and duly numbered are several articles of familiar use, and to the players are given cards with numbered lines and pencils attached whereon to write their guesses respecting certain details of these objects. The leader has, of course, previously ascertained the correct answers, which are written upon his or her card.

By way of suggestion, the following questions may be asked:

What is the height of a man's silk hat?
How many seeds in an apple or orange?
What is the weight of an egg?
How many peanuts in a pint?
Draw the face of a clock. (The difficulty arises when the V is reached.)
How many pins in a paper?
How many safety-matches in a box?
What is the exact diameter of a half-dollar?
How many spokes in a wheel?

If it be desired to give prizes to the best guesser, it should be something national (Yankees being preëminent in that accomplishment)—if only a flag. A nutmeg might answer for a "booby prize," as commemorative of a Connecticut Yankee of inglorious fame.

THE GARDEN GATE

THE Garden Gate is a very pretty game. A ring is formed of all the players except one, who stands in the middle. The others dance round her three times, and when they stop she begins to sing:

"Open wide the garden gate, the garden gate, the garden gate,
Open wide the garden gate and let me through."

The circle then dances round her again, singing:

"Get the key of the garden gate, the garden gate, the garden gate,
Get the key of the garden gate and open and let yourself through."

The girl inside the circle, pretending to sob, replies:

"I've lost the key of the garden gate, the garden gate, the garden gate,
I've lost the key of the garden gate, and cannot let myself through."

But the dancers dance round and round her, singing:

"You may stop all night within the gate, within the gate, within the gate,
You may stop all night within the gate, unless you have strength to break through."

The captive then rushes to the weakest part of the ring, and tries to break through by throwing her whole weight upon the clasped hands of the children, and generally contrives to break through, when another of the players takes the place in the middle.

RING-TOSS

SAW a foot from the handle of a child's broom and fix this round stick upright by making a suitable hole for it in a piece of board twelve inches square. Get half a dozen embroidery rings and cover them with bright-colored ribbon or silk. Then try tossing these rings over the upright stick, standing a few feet away. Gradually increase the distance between the thrower and the stick. This game is very popular on shipboard, but there the rings are made of rope closely and firmly woven.

LOST AND FOUND

A GAME very similar to the familiar one called "Consequences" is that of "Lost and Found," which is played in an exactly similar manner, but the questions are quite different:—(1) Lost, (2) by whom, (3) at what time, (4) where, (5) found by, (6) in what condition, (7) what time, (8) the reward.

The answers may be something like the following: (1) Lost, a postage-stamp, (2) by sister Jane, (3) at three in the morning, (4) in New Orleans, (5) it was found by a policeman, (6) rather the worse for wear, (7) at dinner-time; (8) the reward was a battered nickel.

PIGS AND DONKEYS

In some book or paper find the picture of a pig or a donkey. With a pencil, divide the picture into half-inch squares. Then get a very large sheet of paper and mark it off into much larger squares. With these as guides, it will not be hard to draw a large picture of a pig or a donkey. Then cut out the figure and paste it on a still larger piece of coarse muslin. Better still, the paper pig or donkey may be placed on the muslin and strongly outlined with a soft pencil. Then the muslin may be hung against a door or wall.

The fun begins when the boys and girls are, in turn, blindfolded. Being furnished with a suitable strip of muslin, they are asked to pin a tail on the donkey. If a pig has been drawn, the players are handed a pencil and asked to give piggy an eye.

By the time all have taken part, the donkey is likely to have tails all over him and piggy has more eyes than a paper of needles.

Of course the winner is the one who places the tail or eye nearest to its proper place.

A GUESSING SOCIAL

A guessing social may be called the five-senses social. The tables are arranged, the first with a number of articles of food on it. Each person is blindfolded and led up to the table, and required to tell the various articles by the sense of taste. The second table has bottles or jars containing such things as vinegar, etc., which have to be designated by smelling. The third exhibit may consist of various kinds of fabric which are to be discriminated from one another by the sense of touch, the guesser being, of course, blindfolded; and for a fourth may be arranged a large number of articles, which each person is allowed to look at for one or two minutes and then required to write a list of them from memory. The fifth table has different tests for hearing. It is extremely interesting to note how much more acute some senses are than others, in each person.

THE MAGICIAN OF MOROCCO

The Magician is formed by holding up one hand, bending down the little finger and the one next to it, holding the first finger straight up, and the middle finger slanting. The top joint of the first finger should be painted to represent a face; a handkerchief which has been knotted at one corner, should then be placed on the top of the finger: this makes the Magician's cap. The remainder of the handkerchief will form the robe. This robe will look much more effective if it is made of a bright-colored silk handkerchief. The first finger makes the head and shoulders of the figure, the middle finger draped by the handkerchief shows one arm, the thumb the other. When showing before company you must ask all sorts of riddles and catches, taking care to make the manikin nod his head and wave his arms all the time, so that it may appear that it is *he* who is speaking.

"BLINDFOLD" GAMES

JINGLING

In this game every player except one is blindfolded. The one who can see carries a small bell, and moving about among the rest, jingles it every now and then, slipping away before he can be caught. It often happens that the players in their efforts to grab the jingler, catch one another, and are not convinced of their mistake till they hear the bell again in a distant part of the room. This is a good game if played with care, and not allowed to become too boisterous.

BUFF WITH A WAND

One of the players, called Buff, is blindfolded, and stands with a cane in his hand in a circle made by the rest of the players. The players dance round him while some one plays a quick tune on the piano, but they all stop if the music suddenly ceases, and Buff points with his wand toward any one in the circle. The player so pointed at takes hold of the end of the wand, while Buff gives a cry in imitation of the voice of some animal or bird. The person holding the wand answers in the same manner, and if, by the sound, Buff can guess who the player is, they change places. If he fails, the music starts afresh, the players dance round, and he must try again to guess aright.

SPOONS

The blind man is given two large spoons, and, all the company having seated themselves in

different parts of the room, he feels his way about until he discovers one of them. Then, with the two spoons, he feels them gently all over, to see if he can tell who it is he has found. Not a word must be spoken, not a sound must be made. If his guess is correct he hands the spoons to his captive, who is blindfolded in turn. The rest of the players should all change places directly the new "spoons" is blindfolded. If not, he or she will remember where they were sitting and will name them easily.

BLIND MAN'S STAB

The players stand at one end of the room. On the open floor, a few paces away, seven or eight pieces of paper about the size of postcards are scattered. On each of these it would be well to write some figure. One of the players is then blindfolded, and taking a stick, sharpened to a point at one end, makes three strides toward the pieces of paper.

Then he stabs at them with his stick, doing his best to pierce those scraps which he knows have the highest numbers on them. Three thrusts are allowed, after which he is led back to the starting-point. If his aims were straight the numbers on the pieces of paper that he hit are reckoned to him. Another player then takes his place, and when each has had a turn, the one with the highest record to his or her name wins. Those stand the best chance who remember, after being blindfolded, where lie the papers with the highest numbers on them.

BLIND PARTNERS

This is a game for four players—two blindfolded and two not. Those who can see take one of the blindfolded as a partner, and all sit down, each at one side of a square table—the blind opposite the blind, with their partners to the right hand. A pack of cards is then scattered freely all over the table and, when ready, the blind players are told to supply their partners with "bricks" for building. They at once set about finding the cards, but to do this only one hand may be used, and they must on no account leave their seats.

The builders, however, may direct them by word of mouth, though by no other means, and while bricks are plentiful, things go fairly well. When they become scarce, excitement begins. The hands of the blind men fly over the table; their partners call out directions as fast as they can, only to see the brick they want carried off by the enemy. Sometimes a card is brushed from the table and time is lost before it can be found. But it must be found, and the pair who have the highest castle, or the most bricks, when all the cards have been used up, have won the game.

THE ADVENTURERS

This is a very good game and will combine both instruction and amusement. The idea is that the company imagines itself to be a party of travelers who are about to set out on a journey to foreign countries.

It would be as well, if not quite certain about the location of the part, to refer to a map.

A place for starting having been decided upon, the first player sets out upon his journey. He tells the company what spot he intends to visit (in imagination) and what kind of conveyance he means to travel in.

On arriving at his destination, the player states what he wishes to buy, and to whom he intends to make a present of his purchase on returning home.

This may seem very simple, but it is not so easy as it appears.

The player must have some knowledge of the country to which he is going, the way he will travel, and the time it will take to complete the journey.

To give an instance, it will not do for the player to state that he is going to Greenland to purchase pineapples, or to Florida to get furs, nor will it do for him to make a present of a meerschaum pipe to a lady, or a Cashmere shawl to a gentleman.

More fun is added to this game if forfeits are exacted for all mistakes.

The game continues, and the second player must make his starting point from where the first leaves off.

GAMES FOR PARTNERS

THE DWARF

This is a most amusing game if well carried out. The two performers must be hidden behind two curtains in front of which a table has been placed.

One of the performers slips his hands into a child's socks and little shoes. He must then disguise his face, by putting on a false mustache, parting his eyebrows, sticking pieces of black court plaster over one or two of his teeth, which will make it appear as though he has lost several teeth. This, with a turban on his head, will prove a very fair disguise. The second performer must now stand behind the first and pass his arms

round him, so that the second performer's hands may appear like the hands of the dwarf, whilst the first performer's hands make his feet. The figure must, of course, be carefully dressed, and the body of the second performer hidden behind the curtains.

The front player now puts his slippered hands upon the table and begins to keep time, while the other performer follows suit with his hands.

The Dwarf can be used either to tell fortunes, make jokes, or ask riddles, and if the performers act their parts well, the guests will laugh very heartily.

WONDERMENT

It is necessary that two only of the party should have a knowledge of this game, and then "wonderment" is sure to be the result.

The two players agree that a certain word shall be regarded as a signal word. As an illustration, imagine this word to be "and."

One of the players announces that he is gifted with second sight, and states that he is able, through a closed door, to name any article touched by any person in sympathy with him, notwithstanding the person may attempt to mystify him by mentioning a lot of other articles. He then chooses his partner, as being one with whom he may be in sympathy, and goes outside.

The player in the room then proceeds to call out, perhaps, as follows: "Table, hearth-rug, piano, footstool and chair, lamp, inkstand." He then places his hand on the back of a chair and asks: "What am I touching now?" the answer will, of course, be "Chair," because the signal-word "and" came immediately before that article.

If the players are skillful there is no need for the trick to be discovered.

MAGIC WRITING

In this game a partner is necessary. The player states to the company, after a few remarks on ancient sign-language, that he is able to read signs made with a stick on the floor, and agrees to leave the room while the company decide upon some word or sentence.

The game is played as follows: It is agreed by the player and his partner that one tap on the floor shall represent A, two taps E, three taps I, four taps O, and five taps U, and that the first letter of each remark the partner makes shall be one of the consonants of the word or sentence decided upon by the company. The consonants must be taken in order. On the player's return, supposing the word chosen to be "March," his partner would commence: "Many people think this game a deception" (initial letter M). One tap on the floor (A). "Really it is very simple" (initial letter R). "Coming to the end soon" (initial letter C). "Hope it has been quite clear" (initial letter H).

A few more signs are made so as not to finish too abruptly, and the player then states the word to be "March." If carefully conducted, this game will interest an audience for a considerable time.

SOME "OUT" GAMES

There are several good games that are played by having chairs or seats too few by one for the players—games in which one must scramble for a place. But of course the one who is "out" has just as much fun as those who are "in" the game a little longer.

GOING TO JERUSALEM

One person goes to the piano, while the others arrange in a line as many chairs, less one, as there are players; the chairs alternately facing opposite directions.

Then, as the pianist begins to play, the others commence marching around the line of chairs, keeping time to the music.

When this suddenly ceases, everybody tries to sit down, but as chairs are fewer by one than players, somebody is left standing and must remain out of the game.

Then another chair is removed and the march continued, until the chairs decrease to one and the players to two. Whichever of these succeeds in seating himself as the music stops has won the game.

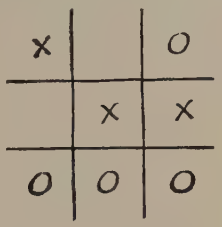
MY LADY'S TOILET

Each having taken the name of some article of dress, chairs are placed for all the party but one, so as to leave one chair too few. They all sit down but one, who is called the Lady's Maid, and stands in the center. She then calls out, "My lady's up and wants her shoes," when the one who has taken that name jumps up and calls "Shoes!" sitting down directly. If any one does not rise as soon as called, a forfeit is incurred. Sometimes she says, "My lady wants her whole toilet," then every one must jump up and change chairs, and as there is a chair too few, of course it occasions a scramble, and whoever is left standing must be Lady's Maid, and call to the others as before.

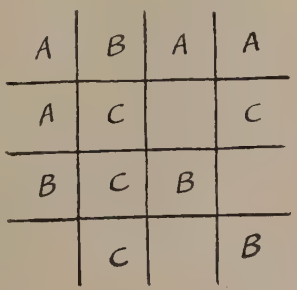
PAPER AND PENCIL GAMES

THREE IN A ROW

THIS is a game every boy or girl thoroughly enjoys. Take a piece of paper and with a pencil draw four cross lines as here shown.



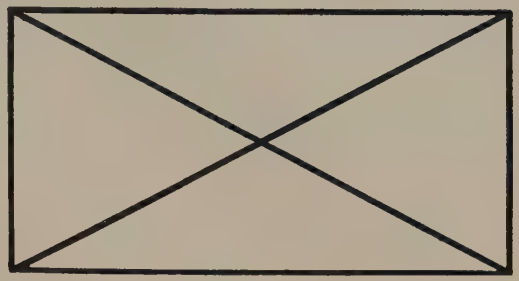
When two persons play at this game, one player takes "noughts," and the other "crosses." The idea is for the one player to try and draw three "noughts" in a line before the other player can do the same with three "crosses." Supposing the player who has chosen the "noughts" commences, and places his "O" in the right-hand top corner, the player who has taken the "crosses" would perhaps place an "X" in the left-hand top corner. The next "O" would be placed in the bottom left-hand corner; then to prevent the line of three "noughts" being completed, the second player would place his "X" in the center square. An "O" would then be immediately placed in the right-hand bottom corner, so that wherever the "X" was placed by the next player, the "noughts" would be bound to win. Say, for instance, the "X" was placed in the center square on the right-hand side, the place for the "O" to be put would be the center square at the bottom, thus securing the game. The diagram would then appear as here given.



When three people play a third line is added both horizontally and vertically, when four play add two lines each way. When more than two play use "A," "B," "C," etc., instead of "O" and "X."

ARTISTIC REFLECTIONS

SEAT a person at a table and place before him a mirror. Give him pencil and paper and request him to draw the following design while looking in the glass:



Hold a sheet of paper over his right hand so as to hide it entirely from his sight.

It will be found surprisingly difficult to draw the diagonal lines.

Another test may be to write his own name while looking in the glass.

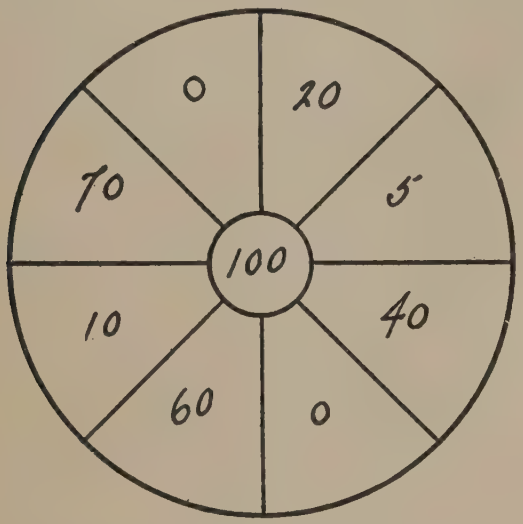
OUTLINES

USE paper and soft lead pencils. At a given word each one scribbles on his or her paper a thick zig-zag line, no matter what shape. The pieces of paper are then exchanged, and everyone must try to turn the line into part of a picture. Another

way is to make five dots instead of a line—that is, one for the eye, two for the feet, and two for the hands. However awkwardly these dots may be placed, they must be worked into a drawing of some living creature. This is an amusing pastime.

"TIT, TAT, TOE"

THERE can be two, three, or four players for this game. First write the players' names across the top of a piece of paper in the order in which they are to play. Next draw a large circle on another sheet of paper, in the center of which draw a smaller one, placing the number 100 within it. The space between the inner and outer circles must be divided into parts, each having a number as in the diagram following.



This having been done, the first player closes his eyes, takes the pencil and places his hand over the diagram, the point of the pencil just touching it. He then repeats the following rhyme, moving the pencil round and round while doing so:

"Tit, tat, toe,
My first go,
Four jolly butcher boys
All in a row.
Stick one up,
Stick one down,
Stick one in
The old man's crown."

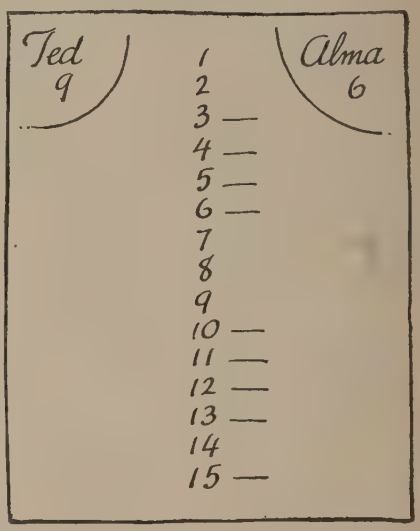
At the word "crown" the player must keep the point of the pencil firmly on the paper, and open his eyes. If the pencil is not within the circle, or if within but with the point of the pencil resting upon a line, then the player gives the pencil to the next player, having scored nothing.

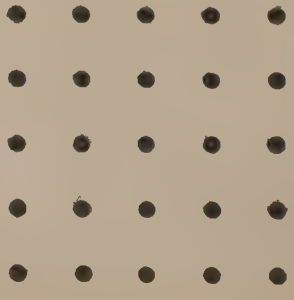
If, on the contrary, at the end of the rhyme, the pencil is found to be resting in a division of the circle, for instance, marked "70," that number is placed beneath the player's name and the section is struck through by drawing a line across it. If afterward the pencil rests in a division of the circle that has been struck out, the player loses his turn in the same way as if the pencil were not in the circle at all, or had rested upon a line of the diagram.

The game continues until all the divisions of the circle have been crossed out, when the numbers gained by each of the players are added, and the one who has scored the highest number of points wins the game.

BACK AND FORTH

Place a row of figures, say from 1 to 15, one below the other, down the middle of a sheet of paper, and suppose that Ted and Alma are to play the game. Let us suppose that Alma writes down 10 on the back of the paper and passes it to Ted, who must not know the number chosen. Ted places a little line beside a number, going from one number to another in no regular order. Presently he checks off 10 and then Alma stops further checking by showing Ted the 10 on the back of the paper. Then Ted, who is called the "Marker," is entitled to as many counts as there are numbers checked, and if 10 chanced to be the ninth number checked he could claim nine points while Alma, who would be called the "Backer," could claim the six remaining points.

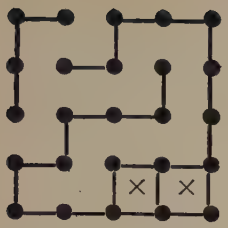


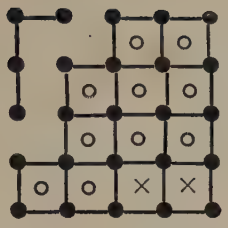


So the paper is passed back and forth. The game may consist in reaching any number agreed on—100 is often chosen.

PATCHWORK

To play this game, put on a sheet of paper a number of dots so as to form a square:





Then two players, in turn, make a line from one dot to another, but they try to make lines so that the opponent cannot complete a square. As often as a player completes a square he can put in it his own mark, an O or an X, and he has earned the right to make another line at once.

Suppose the squares were marked as shown, the next player might make ten O's.

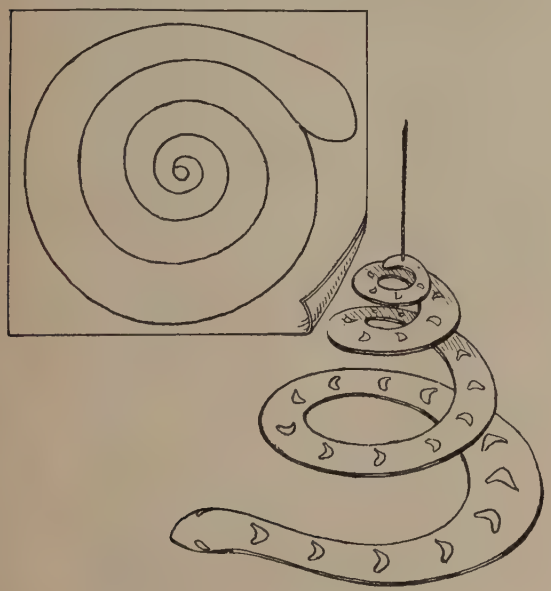
The one having won the O's would be obliged to make one more line, so the other player would gain four, making the score six to ten.

It is more fun to make large squares; instead of a five dot square, make one of seven or more.

TOYS AND TOY GAMES

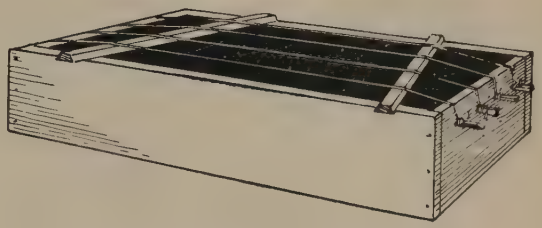
AN AEOLIAN HARP

This can be made on a long, thin pine box, about four or six inches deep. Fasten to each end of the box little bridges and stretch across them thin strings of catgut. At one end fasten the strings to the box itself, and at the other to screw pins. By this means the strings can be tightened or loosened at will. Place the harp in a current of air, and very sweet, soft tunes may be obtained.



ANIMATED SERPENT

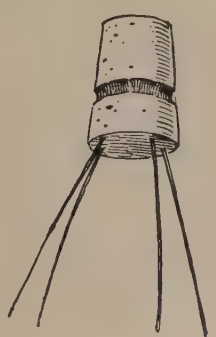
Take a piece of cardboard, firm, but not too thick, and draw up it the form of a coiled-up serpent. Carefully cut out the serpent, going round and round until you reach the tip of its tail. Paint it green and gold in stripes, fasten a thread through the tail, and suspend it from the mantelpiece, or wherever there is a current of air, and it will twist and writhe as though it were alive.



THE DANCING HIGHLANDERS

Get an old glove and cut the first two fingers down to the second joint, slip the glove on to the hand, on the two bare fingers put a pair of doll's socks, the one for the first finger being padded in the toe so as to make the finger as long as the second finger. The tips cut from the gloves should be used as shoes.

You must have previously cut out of cardboard the upper part of a Highlander's figure, painted the face, and dressed it in a kilt. This must be fastened to the glove either with glue, or with stitching, in such a manner that the fingers appear like the Highlander's legs. The figure can then be made to dance jigs and cut capers in a very funny manner.



THE CORK DANCER

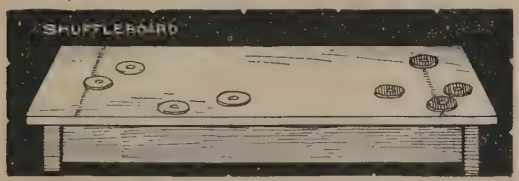
Cut out the head and bust of a figure in cork; run four stout bristles into this so that it will stand upright. Paint the face, put on a cap and dress of tissue paper, then stand it upon the sounding board of a square or grand piano and play a lively tune. The vibration will cause the figure to dance very quaintly.

SHOVELBOARD, OR SHUFFLEBOARD

Take a board, or else use an unpolished table that will not suffer by a little scratching. Rule a line at each end, five inches from the end. Take eight pieces of metal or heavy counters, and give two each to four players.

It is usual to play in sides, and the counters must be marked so that the four belonging to one side may be distinguished from the opponents'.

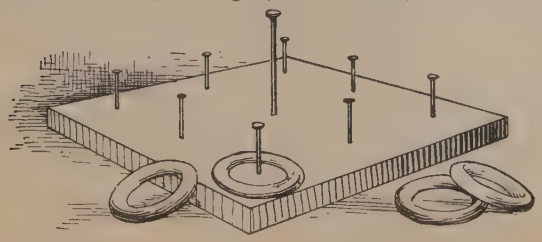
The counters are placed on the line at one end and, turn and turn about, first friend, then foe, push or shuffle these towards the opposite line. If the counters rest on the line, one point is counted; if they cross the line, two points are counted, and if a counter rests at the edge of the table, half on, half off, it counts three.



The counters which do not cross the line, or which fall off, count no points. Twenty-one points is the limit for the game.

RING THE NAIL

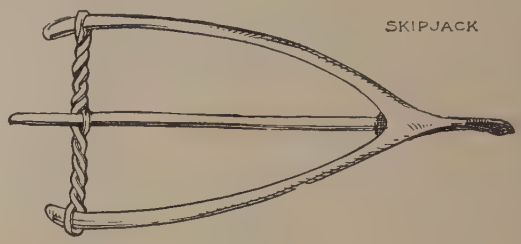
Drive a number of nails into a board, taking care that a nail in the center is very much taller than the rest. This is called the King. Some small rings are now required, brass curtain rings answer the purpose very well. The nails must be far enough apart so that a ring cannot fall over two at a time. Each player is given an equal number of rings, and must try to throw them over the nails. For every successful cast five is counted, unless the King is ringed, when twenty is counted.



RING THE NAIL

MAGIC FLUTE

Take an unused cork that has neither crack nor hole in it; place it against the teeth, holding it tightly with the lips, and play upon it with the handles of two forks. An imitation of the sound of a flute will thus be produced, and simple airs can be played.



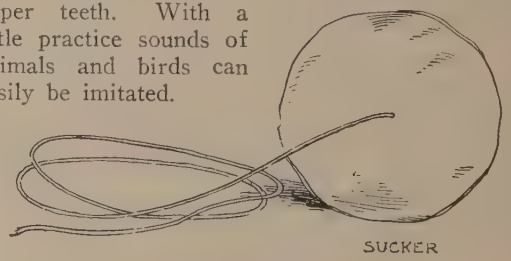
SKIPJACK

Skipjack is made from the wishbone of a fowl. Clean it well and fix two pieces of strong elastic or catgut to the two arms. These must be well twisted before being made fast. Then insert a piece of stick in the center of the twisted strings, pull the long end of the stick backwards, fasten it to the pointed arch of the wishbone with a piece of cobbler's wax, place the toy on the ground, stick downward, and very soon the wax will give and "Jack" will begin to skip.

THE MOCKING CALL

Cut a small square piece from the leaf of the common leek, lay it on a clean board, and scrape away a piece of the green, pulpy substance of the leaf, being very careful not to injure the skin.

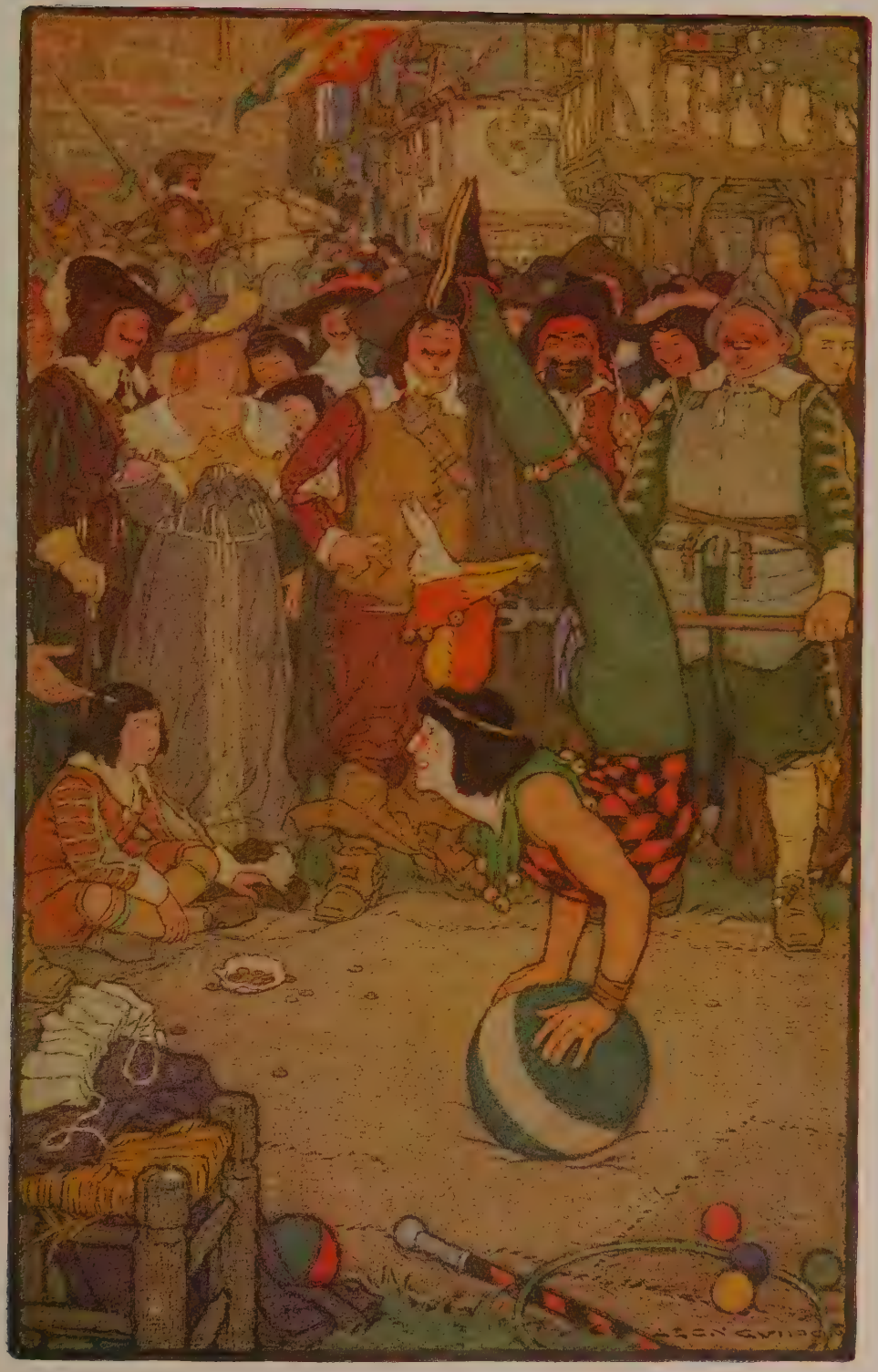
Place this against the roof of the mouth with the skin side downwards; press it into place with the tongue, and blow between the tongue and upper teeth. With a little practice sounds of animals and birds can easily be imitated.



SUCKER

A SUCKER

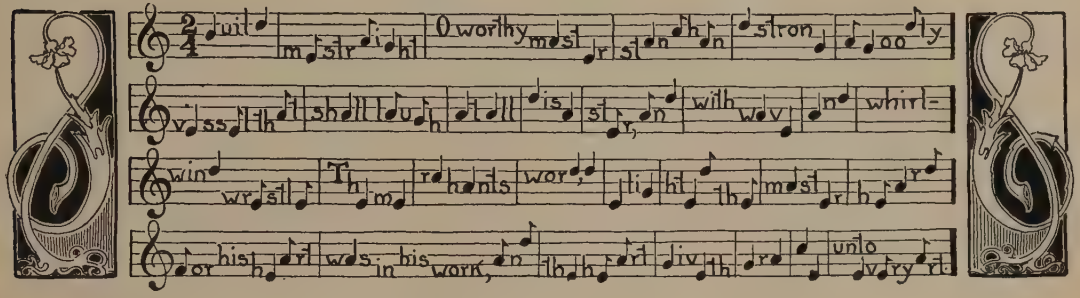
Cut a round piece of leather and bore a small hole in the center. Through this hole pass a string with a knot at one end sufficiently large to prevent the string running through. Soak the leather thoroughly, then press it against the flat surface of some object you wish to lift. When all the air has been excluded you will find the object can easily be lifted by means of the sucker.



THE STREET CLOWN
From the painting by Leon Guipon

ILLUSTRATED PUZZLES AND CHARADES

MUSICAL PUZZLE



How many can find, in the above lines, two verses from a famous poem by Longfellow?

CHARADES

I

My *first* is a statesman, a pen and a bird;
There are people who worship my *last,* I have heard.
My *whole* sailed away in a ship called the Argo,
And hoped to obtain a much coveted cargo.

II

In a little school-house that stood on a hill
A little old schoolmaster taught with a will.
But over his pupils he had no control;
They said he was crusty and cross and my *whole.*
And the rascals declared it would serve him just right
To play him a practical joke some fine night.
So down to the river they went, and they took
My *first* from his *last* in the dark, muddy brook.
Then they eagerly hurried, yet quiet as a mouse,
Till they came to the little old schoolmaster's house.
They smuggled my *first* in my *last* with great glee,
And chuckled to think how irate he would be.

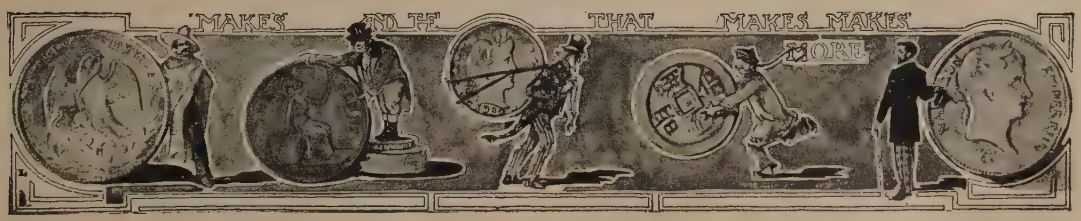
III

Men often strive my *first* to gain
By strength or skill, by speed or worth;
It causes deepest woe and pain,
It causes also joy and mirth.

I watched a tennis-player serve,
And through the air the ball whizzed fast,
But took an unexpected curve;
The umpire said it was my *last.*

With thoughtful eyes and puzzled brow,
It is my *whole* you 're reading now.

REBUS



The answer to the above rebus is an old saying that should be heeded by spendthrifts

KING'S MOVE PUZZLE

The eighty-one squares in this puzzle contain the names of forty-two animals. They may be spelled out by what is known in chess as the "king's move," namely, one square at a time in any direction. Thus, from the first O on the second line, one could move to X, N, Y, L, F, U, I or S. Thus, dog might be found in the squares 75, 65, 56; and porcupine in 33, 43, 35, 45, 54, 63, 62, 70, and 71.

CONCEALED PROVERB

OH! IT'S NICE TO FLOAT IN AN OPEN BOAT
WITH AN ELDERLY OWL FOR CREW,
IF ONE DOES N'T GET ILL WHEN THE WHITE
SAILS FILL
AND THE WIND WHIPS THE WAVES TILL
THEY BOIL CLEAR THROUGH;
OH! THAT IS THE LIFE FOR THE OWL AND ME,
I BLOWS MY PIPE AND "AYE, AYE!" SAYS HE;
THERE'S NOBODY ROUND BUT JUST WE TWO,
BUT THAT OWL BY HIMSELF IS AS GOOD AS
A CREW.

By taking one word from each of the eight lines of the above verse a proverb may be formed

METAMORPHOSES

THE problem is to change one given word to another given word, by altering one letter at a time, each alteration making a new word, the number of letters being always the same, and the letters remaining always in the same order. Example: Change LAMP to FIRE in four moves. Answer: lamp, lame, fame, fare, fire.

In the accompanying picture, change HENS to COOP in ten moves. Each change is shown in the illustration.

IV

THOUGH some one spoke this truthful word,
"The pen is mightier than the sword,"
Without my *first,* you 'll all agree,
Of little use the pen would be.

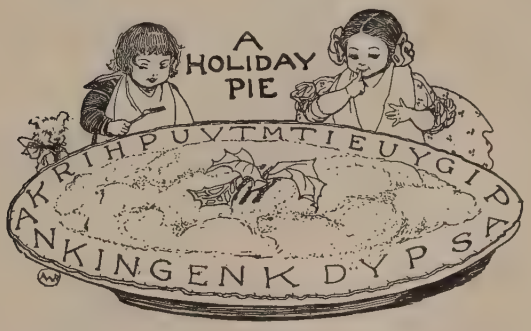
Deep in my *second,* long ago,
Young Mr. Green was said to throw
A victim innocent of wrong,
The hero of a well-known song.
What products of what mighty brains!
What wondrous books my *whole* contains!
What reams of prose and verse! Yet all
Tinged with the bitterness of gall!

V

MY *first,* men call thee wicked, and perhaps they may be right,
Yet I contend thou shouldst be judged according to thy light.

My *last,* thou art a messenger received with joy or dread,—
Frequently driven, very deaf, found in an humble shed.

My *whole,* of upright bearing, and found in many lands,
In order to be seen of men, upon street-corners stands.



BY beginning with a certain letter and going round and round, skipping the same number of letters each time, five words, often heard at a certain season of the year, may be spelled.

DIAGONAL

All the pictured objects may be described by words of equal length. When rightly guessed and written one below another, the diagonal (beginning at the upper, left-hand letter and ending with the lower, right-hand letter) will spell a word often used.

VI

To the grandest of monarchs that ever was seen
My *first* was presented by Sheba's fair queen.

Far, far away back in the ages long past,
According to science, the earth was my *last*.

My *whole* is a creature exceedingly fair,
Addicted to singing and combing her hair.

VII

It was my *whole*, a thunder-storm had burst;
My *last* was fierce, and filled us with my *first*.

VIII

Beneath the Roman Eagle's glory,
Great Cæsar, famed in song and story,
Triumphant banners floating o'er him,
Carried my Roman *first* before him.

In springtime days of sunny weather,
When lads and lasses dance together,
Around the May-pole gaily flying,
They are my *last*, there 's no denying.

A gallant knight and lovely lady
Were sauntering down a pathway shady;
He offered her, with words beguiling,
My *whole*, which she accepted, smiling.

IX

Old Deacon Griggs made money fast;
His greatest virtue was my *last*.
But his son John turned out my *whole*,
Which grieved the deacon's sordid soul;
For hast'ning to my *first*, the son
Disbursed the gold that Griggs had won.

X

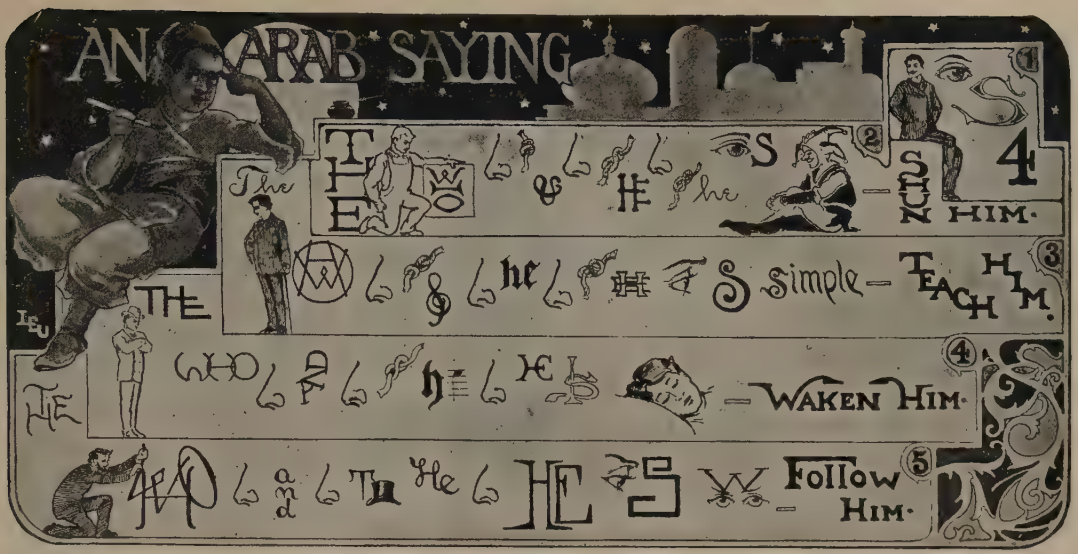
A Scotsman and a sailor met
One day upon the shore;
And one was my *first* with a coat of my *last*,
And my *whole* the other wore.

XI

An ancient family of Chaldee
Went from my *first* to Canaan's land.
My *second* I can never see,
But I can hold it in my hand.
My *whole* is found on the ocean's bed,
Though often on pillows he rests his head.

A PATRIOTIC PUZZLE

Each of the five little pictures may be described by a word of five letters. When rightly guessed and written one below another, the letters from 1 to 15 will spell the name of an American poet who wrote a famous song.

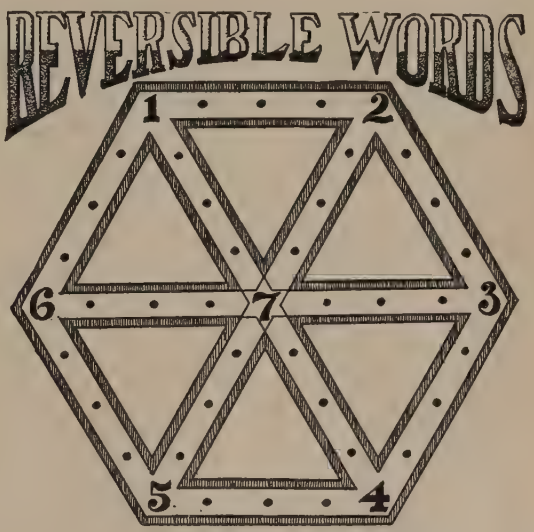


HERE is an Arab saying. It begins with the little picture at the right-hand upper corner, marked 1. That reads, "Man is four." How do the four following lines read?

NUMERICAL ENIGMA

IN this numerical enigma the words are pictured instead of described. When the eleven objects have been rightly guessed, and the letters set down in proper order, they will spell a quotation from "Twelfth Night."

REVERSIBLE WORDS



FROM 1 to 2 (five letters), a merrymaking; from 2 to 1, one of the six mechanical powers; from 2 to 3, nooses; from 3 to 2, found in every work-basket; from 3 to 4, a narrow piece of leather; from 4 to 3, portions; from 4 to 5, removes the outer covering; from 5 to 4, to slumber; from 5 to 6, haste; from 6 to 5, great depths; from 6 to 1, to delay; from 1 to 6, fed again; from 1 to 7, fumes; from 7 to 1, beloved by smokers; from 2 to 7, plunders; from 7 to 2, a high seat without a

back; from 3 to 7, genders; from 7 to 3, the same; from 4 to 7, harbors; from 7 to 4, a strap; from 5 to 7, checks; from 7 to 5, stains; from 6 to 7, drags; from 7 to 6, turf.

XII

Leaving my *whole* with grief and pain,
Columbus sailed across the main.
He came at last to western lands
And saw the Red Men's savage bands.
They were my *last*, they were my *first*,
Columbus' fears were then dispersed.

XIII

My *whole* drops from trees.
My *last* is a season,
When as every one sees
My *whole* drops from trees.

My *first* is a breeze,
And that is the reason
My *whole* drops from trees.
My *last* is a season.

XIV

My *first* was ground beneath the oppressor's wheel,
Subjected unto barbarous tyrannies;
With ears cut off, encaged in netted wire
Into a burning fiery furnace thrust.
My *first* take from my *second*, and my *whole*
Remains.
My *second* is a faithful friend.
Gaily with him across the moors I go
From morn to dewy eve.
I went one day
To visit an old man. Beside the fire
He sate. His well-loved pipe, made of my *whole*,
He smoked in calm and undisturbed content.

XV

My *total* of the heavens showed that a storm would burst,
So we went into my *second* before it should my *first*.

CONCEALED WORDS

What two objects, common at Christmas-time, are concealed in the accompanying Christmas stocking?

A CAKE PUZZLE

Find the names of fourteen kinds of cake in the accompanying illustration.

XVI

My dogs I love, my horses I adore;
They 're much to me, and yet my *last* is more.
And though my *first* is less, my *whole*, I know,
Has ever been my *last's* unconquered foe.

XVII

In certain realms men have to bring
My *first* to earth before their king;
In others, they are only bound
To make my *second* touch the ground.
My *whole* 's a curious little man—
One of a most amusing clan.

XVIII

We were all alone in the castle,
Sir Harry and my *first;*
We sat by the smold'ring embers,
And idly we conversed.

Sir Harry went to the window
And looked out through my *last.*
" 'T is a biting night outside," quoth he,
"It blows a roaring blast."

It was twelve by the clock in the turret,
I was smoking my last cigar;
My *whole*, on the bridge at midnight,
Was chained to a metal bar.

XIX

In my *first* sweet Peggy rode,
Like my *whole* her fair cheek glowed;
At her feet my heart I 'd cast,
If she 'd only be my *last*.

XX

My *first*, of high degree,
Thousands succumb to thee—
In Oriental countries thou art found;
Beneath thy mighty power
Thy fainting victims cower,
Thy greatness brings them prostrate to the ground.

Unhonored and unsung,
My *second* was, when young,
Beheaded by a tyrant's stern decree;
Her home and friends she left,
Her children were bereft,
Yet martyred in a worthy cause was she.

In far Afghanistan,
In China and Japan,
On Greenland's ice and India's coral strands;
My *whole* in mighty hordes,
So history records,
Worship their idols in barbaric bands.

MILITARY ACROSTIC

When the ten tools shown in the above picture have been rightly guessed, and the words (of unequal length) written one below another, one of the rows of letters, reading downward, will spell the name of a very famous English general.

MISSING LETTER PUZZLE

This little man has the whole alphabet in his bag. What one letter must he take from it to complete the nine syllables shown in the picture?

ANSWERS TO ILLUSTRATED PUZZLES AND CHARADES

Musical Puzzle.

Eight lines from "The Building of the Ship," beginning:

Build me straight, O worthy master;
Stanch and strong, a goodly vessel
That shall laugh at all disaster
And with wave and whirlwind wrestle.

Rebus. Money makes money, and the money that money makes, makes more money.

King's Move Puzzle. Bison, bear, bull, giraffe, buffalo, pig, goat, stag, dog, tiger, fox, wolf, ox, lynx, squirrel, panther, porcupine, camel, elk, hyena, cat, rat, calf, mole, seal, lion, weasel, boar, otter, antelope, monkey, donkey, elephant, rhinoceros, deer, horse, hare, leopard, ape, lamb, doe and beaver.

Concealed Proverb. It 's an ill wind that blows nobody good.

Metamorphoses. Hens, lens, legs, logs, cogs, cows, cowl, coil, coin, coon, coop.

A Holiday Pie. Begin at the "t" under the word "Pie" and go to the left, skipping three letters each time. In this way may be spelled out "Thanksgiving Day, turkey, pumpkin-pie."

Diagonal. Money. 1. Month. 2. Horse. 3. Honey. 4. Comet. 5. Candy.

A Patriotic Puzzle. From 1 to 15, Francis Scott Key. 1. Crate. 2. Crown. 3. Fight. 4. Story. 5. Kings.

Numerical Enigma. "Love sought is good, but given unsought is better."

Reversible Words. From 1 to 2, revel; 2 to 3, loops; 3 to 4, strap; 4 to 5, peels; 5 to 6, speed; 6 to 1, defer; 1 to 7, rages; 2 to 7, loots; 3 to 7, sexes; 4 to 7, ports; 5 to 7, stops; 6 to 7, draws.

An Arab Saying. Man is four. The man who knows not and knows not he knows not, he is a fool—shun him. The man who knows not and knows he knows not, he is simple—teach him. The man who knows and knows not he knows, he is asleep—waken him. The man who knows and knows that he knows, he is wise—follow him.

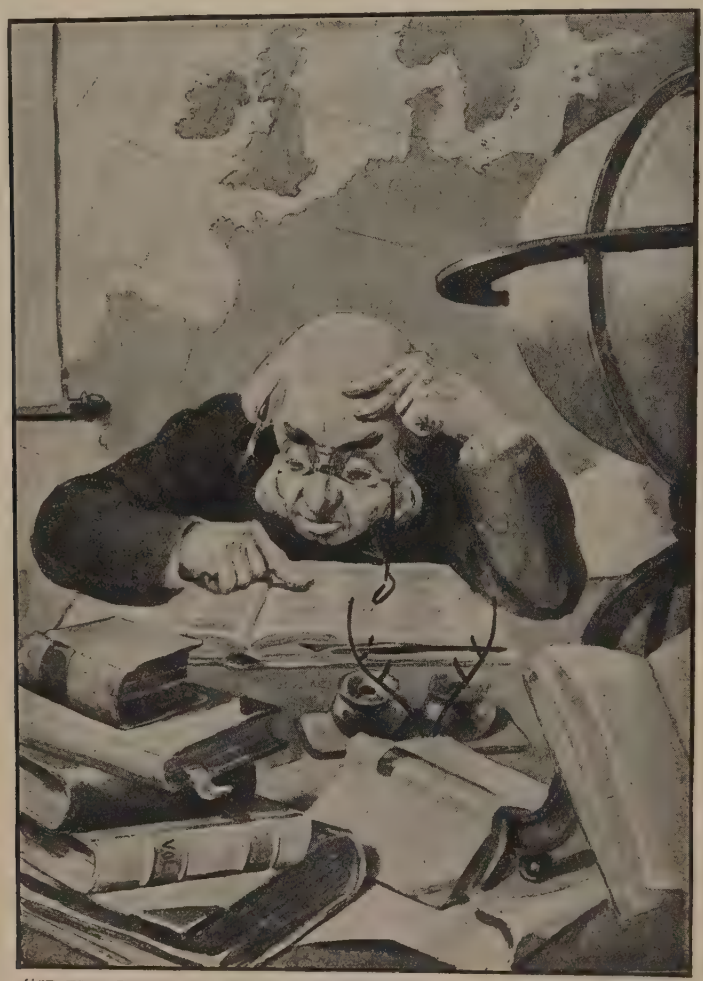
A Cake Puzzle. 1. Lady. 2. Mountain. 3. Wheat. 4. Fruit. 5. Hoe. 6. Pan. 7. Marble. 8. Nut. 9. Cup. 10. Plum. 11. Corn. 12. Sponge. 13. Angel. 14. Fish.

Concealed Words. "Toys" and "Candy."

Military Acrostic. Third row, Wellington. 1. Saw. 2. Tweezers. 3. Rule. 4. Awl. 5. Chisel. 6. Pincers. 7. Auger. 8. Hatchet. 9. Spokeshave. 10. Punch.

Missing Letter Puzzle. The letter X.

Charades. I. Jay-son, Jason. II. Crab-bed. III. Cup-let, couplet. IV. Ink-well. V. Lamp-post. VI. Myrrh, made, mermaid. VII. Awe-gust, August. VIII. Nose-gay. IX. Spend-thrift. X. Tar-tan. XI. Ur-chin. XII. Kind-red. XIII. Wind-fall. XIV. Corn-cob. XV. Pour-tent, por-tent. XVI. Less-son, lesson. XVII. Brow-knee, brownie. XVIII. Eye-glass. XIX. Car-mine. XX. Heat-hen, heathen.



"IF THE *FIRST* IS A BLACK LIQUID AND THE *LAST* A DEEP EXCAVATION HOLDING WATER, WHAT CAN THE *WHOLE* POSSIBLY BE!"

RIDDLES, CHARADES, AND CONUNDRUMS

From the earliest times we find people interested in riddles. Some of these old riddles are so good that they are still remembered and quoted. So pleasant an exercise for ingenuity and fancy as making enigmas has never languished and to-day it is more actively followed than ever before.

In connection with this subject the mind is apt to go back to the Sphinx whom the ancients credited with being a wonderful riddle-maker. When we think of the Sphinx, however, we are likely to recall the great statue of the Egyptian desert; but the Sphinx who devised the famous riddle dwelt in Greece and not in Egypt. She was not eager to have her riddle answered, so she spent her time prowling around Thebes in Bœotia where people were noted for their dull wits. Seated on a rock, she stopped every passing Theban and propounded the riddle. Unless the proper answer was given the unfortunate person was promptly slain by the monster. It is not strange that men, on being asked the riddle, and knowing the fate that awaited failure, were frightened out of the few wits they had and were added to the long roll of victims.

This was a serious matter for Thebes which was thus losing many of her citizens; therefore it was proclaimed that whoever should deliver the country from the Sphinx should be king.

Then Œdipus appeared and to the riddle, "What being has four feet and two feet and three feet and only one voice; its feet vary, and it has most when it is weakest?" he answered,

"Man; for in his infancy he crawls upon all fours; in manhood he stands erect upon two feet; and in old age he needs a staff—really, a third 'foot' to support his tottering steps."

The Sphinx, mightily enraged at having at last met her match, threw herself from a rock and so perished, to the joy and relief of the terrorized Thebans.

Another famous old riddle is found in the Bible, in the fourteenth chapter of Judges, in which Samson offers this enigma:

"Out of the eater came forth meat and out of the strong came forth sweetness." Though this was simple enough to Samson, yet those to whom he presented it "could not in three days expound the riddle"; and Samson's wife, after seven days of fruitless effort, finally, by tears and threats, prevailed upon him to tell her the solution.

There is an amusing old riddle that, to this day, people seem unwilling to forget, probably because it teaches a valuable lesson—to consider things, first of all, from a sane and common-sense standpoint. Let the riddle explain this:

As I was going to St. Ives
I met a man with seven wives;
Each wife had seven sacks;
Each sack had seven cats;
Each cat had seven kits;
Kits, cats, sacks and wives,
How many were going to St. Ives?

On hearing this some sagacious ones begin an elaborate series of multiplications by seven; but read the lines again and the answer fairly stares at you. One, of course, for "as I was going to St. Ives," therefore the others were coming from St. Ives, and with them the riddle has nothing to do.

Many a good modern puzzle, also, particularly among charades, carries its answer in plain sight if one is clever enough to detect it, as the two following examples will show:

In my first my second sat,
My third and fourth I ate.

The answer is "insatiate"—in-sat-i-ate.

My first is French, my second English, my whole, Latin. Answer, La-tin.

But not all puzzles are easy of solution. Some send us to dictionaries, encyclopedias and atlases, hunting for words or names on which the solution depends; and—who can tell?—this may be one of the very best features of puzzle-solving, this sending us to hunt up new and curious words.

Whether the answer is found readily or after hard work the results are good, for the exercise quickens the wits, develops the ingenuity and teaches many new words, thus adding to our mental capital.

Every fashion, even that of puzzles, changes, and to-day, instead of the old-time "riddle" we have enigmas of many kinds, such as word-squares, diamonds, numerical enigmas, double acrostics, geometrical puzzles, anagrams and charades. Possibly the last named should have headed the list, for the charade has found more favor with scholars than any other kind of puzzle. It seems to offer a wider scope for ingenuity. To-day there are busy and successful authors who like to unbend from their more serious work to entertain themselves and their friends by composing ingenious charades. One man, in particular, after writing a book that made a profound and lasting impression found recreation and relaxation in such work. His charades were so clever that his publisher made a book of them. The public were of the same mind as the publisher for they found the charades so ingenious and diverting that, like Oliver Twist, they wanted "more"; therefore, a second book was made, and it is difficult to say which gave more pleasure—his novel, with its message of hope and cheer, or his charades which brought fun and entertainment into hundreds of homes.

While the words "riddle," "puzzle" and "enigma" have come to mean any mystifying problem, years ago the word "riddle" meant a rhymed puzzle in which some amusing problem was cleverly stated; as the following examples, by famous writers, will show.

I

By Mrs. Barbauld

There's not a bird that cleaves the sky
With crest or plume more gay than I,
  Yet guess me by this token—
That I am never seen to fly
  Unless my wings are broken.
Answer, an army.

II

By Lord Macaulay

Cut down, yet saved with much ado and pain;
Scattered, dispersed, yet gathered up again!
Withered though young, though dying, yet perfumed,
Laid up with care, but kept to be consumed.
Answer, hay.

III

By Mrs. Barbauld

I always murmur, yet I never weep;
I always lie in bed, yet never sleep;
My mouth is wide and larger than my head,
And much disgorges though 'tis never fed.
I have no legs nor feet, yet swiftly run,
And the more falls I get, move faster on.
Answer, a river.

IV

By Hannah More

I'm a strange contradiction: I'm new and I'm old,
I'm sometimes in tatters and oft decked in gold,
Though I never could read yet lettered I'm found,
Though blind, I enlighten; though free, I am bound.
I'm English, I'm German, I'm French and I'm Dutch;
Some love me too dearly; some slight me too much;
I often die young, though I sometimes live ages,
And no queen is attended by so many pages.
Answer, a book.

V

By Charles James Fox

Formed long ago, yet made to-day,
  And most employed when others sleep,
What few would like to give away,
  And fewer still to keep.
Answer, a bed.

VI

By Dean Swift

In youth exalted high in air,
Or bathing in the streamlet fair,
Nature to form me took delight
And clothed my body all in white;
My person tall and slender waist
On either side with fringes graced;
Till me that tyrant Man espied,
And dragged me from my mother's side.
No wonder that I look so thin,
The monster stripped me to the skin;
My body flayed, my hair he cropped,
And head and foot both off he lopped;
And then with heart more hard than stone,
Picked all the marrow from my bone.
To vex me more, he took a freak
To slit my tongue, and make me speak.
But that which wonderful appears,
I speak to eyes and not to ears.
All languages I now command
Yet not a word I understand.
Answer, a goose-quill.

The following pages contain some of the best puzzles, both old and new. You will find many of them easy, others a little difficult. See how many of them you can answer.

RIDDLES

1. As round as an apple, as deep as a cup,
And all the King's horses can't pull it up.

2. Take five hundred, add nothing, and then add one hundred. The result will be a favorite toy.

3. Long legs, crooked thighs,
Little head, and no eyes.

4. I strengthen the weak, I cross the wide sea,
I frighten the thief, and I grow on a tree.

5. Thirty white horses upon a red hill,
Now they tramp, now they champ, now they stand still.

6. As soft as silk, as white as milk,
As bitter as gall, I'm rather tall,
And a green coat covers me all.

7. Little Nan Etticoat,
In a white petticoat,
And a red nose;
The longer she stands,
The shorter she grows.

8. Humpty Dumpty sat on a wall,
Humpty Dumpty had a great fall;
Not all the King's horses, nor all the King's men,
Could set Humpty Dumpty up again.

9. I went to the wood and got it;
I sat me down and looked for it;
I looked for it but couldn't find it;
And I had it in my hand all the time.

10. There was a girl in our town,
Silk an' satin was her gown,
Silk an' satin, gold an' velvet,
Guess her name, three times I've tell'd it.

11. Elizabeth, Elspeth, Betsy, and Bess,
They all went together to seek a bird's nest.
They found a bird's nest with five eggs in,
They all took one, and left four in.

12.
M
E

Who can find the name of a flower, enigmatically expressed, in the above letters?

13. There is one that has a head without an eye,
And there's one that has an eye without a head:
You may find the answer if you try
And when all is said,
Half the answer hangs upon a thread.

14. How shall the following be read?

Yy u r yy u b
I c u r yy 4 me.

15. A letter and a morsel,
Or a tail and joiner's tool,
Will make a Bible measure
That is seldom taught in school.

16. As I was going o'er Westminster bridge
I met with a Westminster scholar;
He pulled off his cap, *an' drew* off his glove,
And wished me a very good morrow.
What was his name?

17. Neither flesh nor fowl, though I have legs;
Laid freshly each day, though I am not eggs;
Neither flower nor fruit, though I've leaves a-many;
And I cannot be bought for a shilling or penny.

18. Two legs sat upon three legs
With one leg in his lap;
In comes four legs,
And runs away with one leg.
Up jumps two legs,
Catches up three legs,
Throws it after four legs
And makes him bring one leg back.

19. How shall the following be read?

U o a o, but I o thee;
O o no o, but O o me;
Then let my o thy o be
And give o o I o thee.

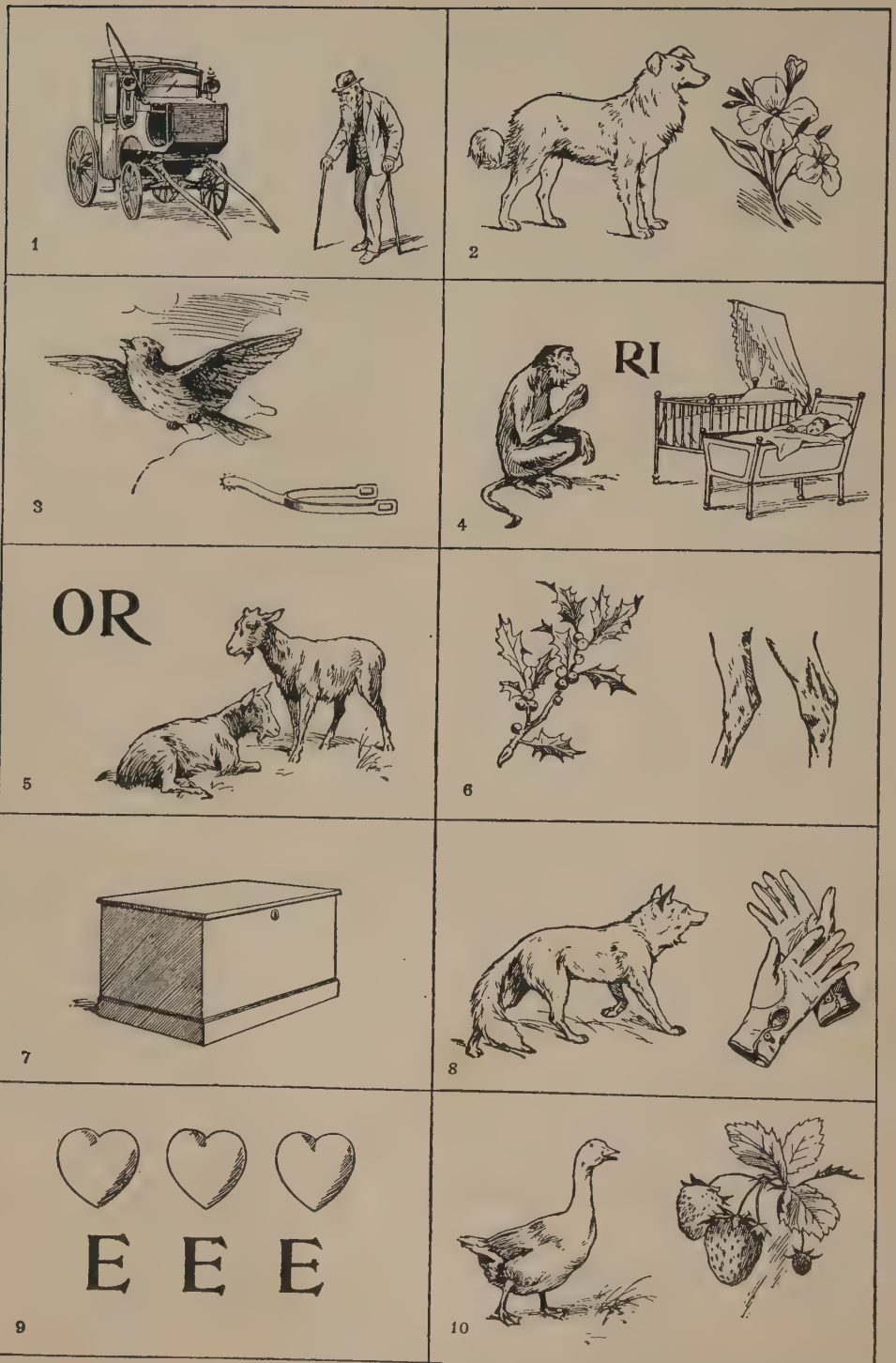
4

20. Change this figure in such a way that it will name a "rare old plant."

21. To 6 add a king and make a Norseman.

22. Running up and down, I make
Many little fingers ache;
Though I'm found within the sea,
I can measure pounds of tea.
Often glittering, rainbow-specked,
I adorn and I protect.

23. Some fill me, some beat me,
Some kill me, some eat me;
I creep and I fly, and my color is green;
And though I'm a season
There's quite a good reason
Why my end or beginning there's no man hath seen.



PUZZLE PICTURE: NAME THE PLANTS THAT THESE PICTURES REPRESENT

PUZZLE PICTURE: GUESS WHAT THESE BOYS AND GIRLS ARE DOING

PUZZLE PICTURE: TO WHAT ANIMALS DO THESE BELONG?

24. I'm only a fish, to be taken and eaten;
Or else I'm a rod with which none have been beaten;
I'm often a rest; so have weary ones found,
Who, when I'm at hand, will not sleep on the ground.

25. Sometimes I am very sly;
Other times a trade I ply;
Over the billows swift I fly;
Now, pray tell me, what am I?

26. The farmer uses me as a hindrance and a protection; I am of interest to those who study heraldry; every sailor dreads me; every lawyer belongs to me; to be summoned before me is often a calamity; yet by musicians I am considered a necessity.

27. Not one moment without me
Could a king or kingdom be;
Not a single grain of wheat
Without me would be complete;
Not a cow-boy on the scout
Finds his herd my help without.

(To be answered by three words pronounced alike but spelled differently.)

28. By the brooklet blooming sweet;
Flying from some tower or spire;
Leading army, leading fleet,
Through the foeman's hottest fire.
Bringing cars to halt complete;
Helping you across the mire;—
Though with uses I'm replete,
Yet, whate'er I do, I tire.

29. When in the forest's leafy glade
A noble tree I stand;
But when the tree is felled I'm found
Within the workman's hand.
I am a level tract of land
Uncrossed by rill or brook;
I am the way you like to see
But never like to look.

30. Take a Chinaman's pride,
Put yourself by its side;
Now pluck out your eye
And place it close by;
Next a wing—how absurd!
Of a house, not a bird.
Now the cup, steaming hot,
Which inebriates not,
But gives pleasant cheer
Must have its place here.
The whole, in various patterns you'll find,
Of silk or of cotton deftly combined.

31. I am found in the kingdoms three,
But though next to him, man I can't be;
For with a body, I have no head,
And though I die, I am never dead;
I oft have a nap, yet never sleep;
I am kept in folds, yet I am not sheep.
Bolted in yards, I am often shown;
Neither fruit nor grain, I am often sown;
Not a top, though spun; not a hoop, though rolled;
Not crushed, though undone; nor fooled when sold;
I may shrink from washing and yet be clean;
And when I am pressed I am glad to be seen;
I *could* send thee my card, but I'll leave thee to guess
My name and my number to make the address.

ALL SORTS OF PUZZLES

1. Omitted Letters

The x's are to be replaced by letters, but the same letter must be retained throughout one sentence. The eight omitted letters will spell a delightful season.

1. xera's xery xain.
2. xnn xnd xgnes xre xlice's xunts.
3. xan xarrie xarry xoal?
4. xn xrab xte xn xpple.
5. xed xook xom's xent.
6. xda xs xn xtaly.
7. "xnly xur xlives," xrdered xscar.
8. xellie, xed's xearly xine.

2. A Hive of Bees

Example: Take bee from to fetch, and leave a circle. Answer, B-ring.

1. Take bee from to boast, and leave a fragment of cloth. 2. Take bee from a boy's nickname, and leave not good. 3. Take bee from the staff of life, and leave to peruse. 4. Take bee from a curve, and leave termination. 5. Take bee from lively, and leave to endanger. 6. Take bee from to whip, and leave to consume. 7. Take bee from part of a tree, and leave a famous place of refuge. 8. Take bee from a sable hue, and leave to need. 9. Take bee from a sudden calamity, and leave vulgar.

3. A Puzzle in Numbers

Take one hundred; add a cipher; add fifty; and then add five hundred. The result will be a common disorder.

A Very Interesting Stunt

Ever Try This ?

PUT DOWN A ROW OF FIGURES, OMITTING THE FIGURE 8 AND ASK THE PERSON TO WHOM YOU ARE SHOWING YOUR PUZZLE WHICH FIGURE HE LIKES BEST.
SAY HE ANSWERS "6"
LOOK WHAT YOU GET BY MULTIPLYING BY 54

```
  1 2 3 4 5 6 7 9
              5 4
-----------------
  4 9 3 8 2 7 1 6
6 1 7 2 8 3 9 5
-----------------
6 6 6 6 6 6 6 6 6
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  1 2 3 4 5 6 7 9
            2 7
-----------------
  8 6 4 1 9 7 5 3
2 4 6 9 1 3 5 8
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3 3 3 3 3 3 3 3 3
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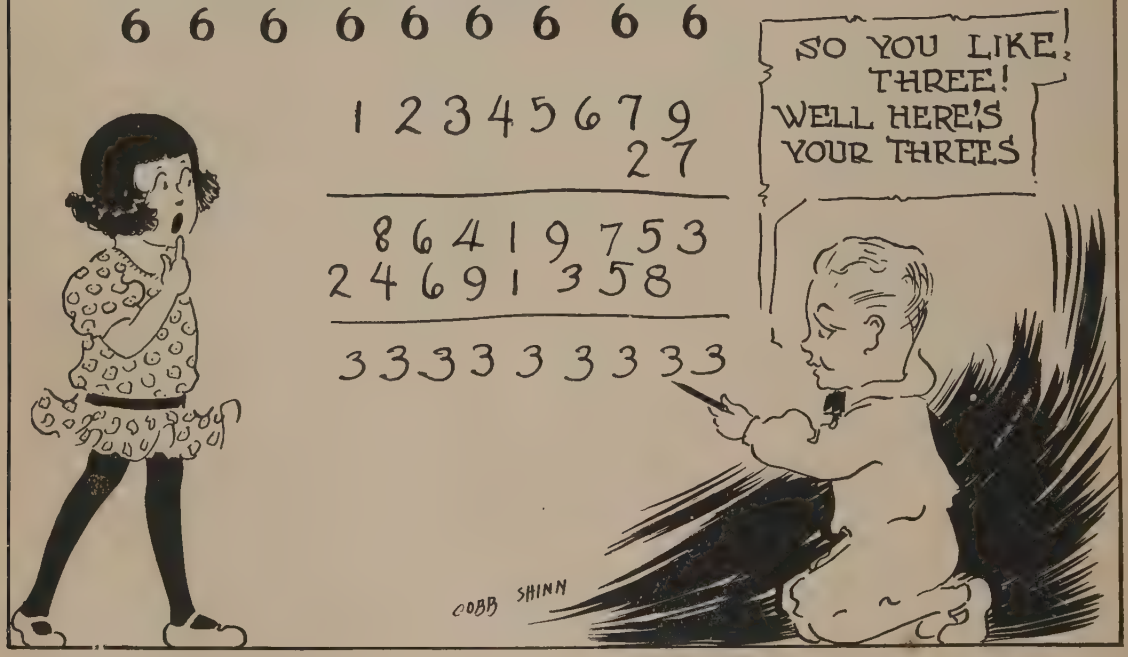

If the person says 4, you can make it come out all 4's by multiplying the row by 36, (4 times 9 is 36). If the person says 5, multiply by 45, (5 times 9 is 45). Always take the number the person happens to name and multiply it by nine, then with this number multiply the row of figures.

4. Forward and Backward

I. Reverse a color, quiet, staid,
And a name for poet you have made.

II. My whole is a kind of tree,
But if you reverse it you'll see
An English river 'twill be.

5. Singular and Plural

Example: Śingular, a straight line; plural, a flower. Answer, row, rose.

1. Singular, a refusal; plural, part of the face. 2. Singular, a month; plural, a labyrinth. 3. Singular, to join; plural, a tool. 4. Singular, the covering of certain animals; plural, a shrub. 5. Singular, not many; plural, to melt. 6. Singular, bright; plural, to look closely. 7. Singular, to steep; plural, to hurt with blows. 8. Singular, the heart of fruit; plural, not fine. 9. Singular, to call like a cat; plural, a goddess. 10. Singular, a soft mass; plural, to sleep lightly.

6. Double Diagonals

X . X
. X .
X . X

The diagonal beginning at the upper left-hand letter and ending with the lower right-hand letter will spell the first name; and the diagonal beginning at the lower left-hand letter and ending at the upper right-hand letter will spell the last name of a famous story by Sir Walter Scott.

Cross-words: 1. A beam. 2. To court. 3. A bone.

7. Alliterations

Supply all the words of a line with the same initial letter.

*ober *ally's *ewing *eams;
*apper *avid *awdling *reams;
*houghtful *hisbe's *hinking *hemes.

*anny *urnishes *ree *ares;
*retty *olly *ickles *ears;
*illy *oxes *arney's *ears.

*reedy *ilbert *athers *old;
*areless *arrie *atches *old;
*miling *tella *houldn't *cold.

*uiet *uincy *uickly *uaffs;
*azy *eonard *eaning *aughs;
*heerful *harley *huckling *haffs.

*radley's *ringing *uilding *ricks;
*usan *ibley's *aving *ix;
*essa *eaches *ommy *ricks.

8. Changed Heads

I am used in baseball. Change my head each time, and I become a domestic animal; to consume; plump; a cover for the head; something found on floor or table; a plant and its seed; a slight rap; an animal that infests warehouses; seated; a large cistern.

9. Additions

Add Y to where cannon look threateningly out,
And two score of soldiers go marching about.
Answer, fort-forty.

1. Add Y to a hindrance misfortune may fling,
And it rests in its richness in many a ring.

2. Add Y to what travels on foot every day,
And now 'tis what's captured when foragers prey.

3. Add Y to dear mother, who makes the home bright,
And here is a month filled with flowers and delight.

4. Add Y to a fish which the anglers may miss,
And under the maples some say it is this.

5. Add Y to a boy, just the first one you meet,
And a finely dressed woman walks on down the street.

10. Letter Words

The following objects can be expressed by a single letter of the alphabet.

1. A river. 2. A bird. 3. A tree. 4. A drink. 5. An insect. 6. A vegetable. 7. Part of a needle. 8. On a Chinaman's head. 9. A body of water. 10. Part of a house. 11. A pronoun. 12. Used in driving cattle.

11. Additions

First, take what steals in summer hours
The sweetness from the fragrant flowers.
Next, add an O, and if exclaimed,
An interjection has been named.
Third, add an A,—here, large and strong,
A serpent drags its length along.
Then add an R; in search of food,
A wild hog roots in yonder wood.
Last, add a D—without a flaw.
It feels the hammer and the saw.

12. Transformations

By adding the same Roman numeral each time, change a drink into a bird; the ocean into an animal; a vegetable into a sound; a domestic animal into a hood; and an archer's weapon into a basin.

13. A Curious Word

What English word of one syllable becomes a word of two syllables if two letters are taken away?

14. A Story in Rhyme

All of the omitted words rhyme.

A strapping youth (his name was ——)
Went out upon the ice to ——;
His fortunes I will now ——.
"Don't go to-day," said sister ——;
But no, the youth was ——,
And so he tempted unkind ——.
The ice was rough, and so his ——
Was speedily quite ——
With surfaces as hard as ——.
(This tale I don't ——.)
He said, "This kind of ice I ——;
I'm sure it would ——
The mildest person in the ——."
He loosed his skates and started ——
For home at no uncertain ——;
But said, "I guess I'd better ——
Till dark, then sneak up to the ——,
So that those silly girls can't ——."
He loitered till 'twas very ——.
In fact, the clock had just struck ——,
Crept up the walk (his care was ——),
But met his father, quite ——;
Ah, then his case was ——!
I'll not describe their ——.

15. A Swarm of Bees

Such havoc as they made! They changed a bit of cloth to boast (b-rag); they changed (1) a spirituous liquor into a bundle of goods; (2) an awkward fellow into part of a whale; (3) a numeral into a hard substance; (4) a bird into a kitchen utensil; (5) an implement for playing tennis into a little shelf; (6) part of the head into a wild animal; (7) drops of water were turned into an organ of thought; (8) a garden tool became part of a bicycle; (9) a large farm was changed into part of a tree; (10) a quantity of paper into a fish; (11) final into a gust of wind; (12) a pile of hay into burnt clay; (13) a small stream into a fish; (14) a machine for making cloth into blossom; (15) an intricate fastening into a thick piece of wood; (16) a bird into a running stream; (17) an apartment into a useful implement; (18) a dash into another useful implement; (19) a dilapidated building into a wild animal; (20) a knave into a peculiarity of the Irish speech; (21) a beam of light into a harsh noise; and (22) everything was changed to a child's plaything.

16. Ten Curious Berries

There's a berry which makes my pony's bed;
And another one which is green when red;
And there's one which rubs you all the wrong way;
And another which swims and quacks all day;
There's one you can play, to beguile your care;
And one at their necks the ladies wear;
There's a berry which seems to be much depressed;
And one is a bird with a speckled breast;
There's one we can see when the tide is low,
And the last you will be when you older grow.

17. A Riddle of Trades

1. Of what trade is the sun?
2. Of what trade is a minister at a wedding?
3. Of what trade is a weathercock?
4. Of what trade is the sun in May?
5. What trade is noted in English literature?
6. What trade is it whose best works are trampled upon?
7. Of what trade is the President?
8. What trade never turns to the left?
9. What trade is more than full?
10. Of what trade can it be said that all its members are men of letters?
11. Of what trade is a little tin dog?
12. What trade is best fitted to cook a hare?

18. Omitted Fruits

D . . . . . D

If a certain fruit you place
Between these letters, in the space
Where you see a line that's dotted,
You will always find it spotted.

S . . . . S

If a fruit is placed aright
'Twixt these letters, for the fight
You will be well armed, and so,
It would seem, will be your foe.

19. Mr. Brown's Family

Mr. Brown was asked how many children he had, and, in reply, he said: "I have six daughters, and each daughter has a brother." How many children had Mr. Brown?

20. Seven Nuts

1. There's a nut that's a kind of a box or a trunk,
2. A nut that is drunk just like tea,
3. A nut that is spread upon biscuits or bread,
4. And a nut that is found by the sea,
5. A nut often used for a boundary line,
6. And a nut that is dug from the ground;
7. But the very best nut of them all, I am sure,
   Is the nut in the frying-pan found.

21. The Race of Years

"I am three times as old as you, Harold," said a father to his son.

"Yes," replied Harold, "but some day you will be only twice as old."

How old were they? And in how many years did Harold's statement come true?

22. Dropped Letter

For first please track
An African black;
Drop out the center, and see
That an emperor's name—
It is of fame—
My next will surely be.

23. Rhyming Blanks

The missing words all rhyme.

As the king rode along on his —— steed, an old ——, who had been sitting on a ——, waiting for him, ran forward, and with many a —— and —— told him of her wrongs. The wind had —— her gray hair into disorder, and the shawl that she had —— over her shoulders was torn and ragged. Her distress as she fell —— on the earth before him, and the sad —— in which she told her pitiful tale, touched the king's heart.

"Oh, be merciful, your Majesty!" she exclaimed; "for you only can help me, a poor —— woman. I had two sons of my ——, but now I have ——. One has been —— down by the reaper Death, and the other has been cruelly exiled to the frigid —— for a crime he never committed. I have —— feeble in his absence, and have worked my fingers to the —— to get food, but I can do it no longer."

The king's face —— with pity and kindness. "You shall have gold," he said; "an ounce for every —— on yonder pine-tree, and your son shall be recalled."

Thankfully the woman rose from the ground on which autumn leaves were —— and exclaimed, "May blessings come to you, as many in number as the birds that have —— into this tree!" Then the king rode on to his palace and ascended the —— to attend to the affairs of state.

24. Twenty Trees

1. Which is the straightest tree that grows?
2. Which one will tell all that it knows?
3. Which one is it that's made of stone?
4. Which older than most others grown?
5. Which one will always languish and sigh?
6. Which one on land do you never spy?
7. Which only after a fire is found?
8. Which round a lady's neck is wound?
9. Which has been oft in bottles kept?
10. Which over the grassy fields has leapt?
11. Which tree is never beautiful?
12. Which from the sea with a hook can you pull.
13. Which is the neatest tree in the land?
14. And which can you carry in your hand?
15. Of what trees are there only two?
16. Which will carry your clothes for you?
17. Which one in every one's mouth must be?
18. And which grows nearest to the sea?
19. Which one on your crops a war will wage?
20. And which has been worn on a pilgrimage?

25. Riddle

What is filled every morning and emptied every night, except once a year when it is filled at night and emptied in the morning?

26. The Squirrel and the Corn

A box has nine ears of corn in it. A squirrel removes three ears a day, and takes nine days to carry all out. How can you explain this?

27. Changed Initials

Well known to all as a covering for the head,
Change my initial, a doze I mean instead.
Once more, and an opening you will see.
Exchange again, I'm found inside a tree.
Once more, I mean then to befall.
Again, I'm used by travelers, one and all.
Again, in this my mother often nursed me.
Exchange again, and this my food would be.
Again, and a sharp blow you've spelt.
Once more, a blow that is hardly seen or felt.

28. The Diner's Reply

A gentleman was seen coming out of a restaurant by a friend, who said to him:

"Well, did you have a good meal?"

The gentleman replied by writing the following curious answer:

"I 8o."

Can you guess what he meant?

29. Missing Words

When the missing words in the following lines have been rightly guessed, their initials will spell a festal day. The nine words all rhyme.

What though the earth be cold and ——
And snow lies thick on field and ——
Smooth frozen are the lake and ——
And we can think of nothing ——
Whatever comes, we're happy ——
With cheer and laugh our voices ——
Down on the river by the ——
We'll skate and skate, though all ——
And shout a merry greeting ——

30. Omitted Word

The same word may be used to fill all the blanks.

He stood in the —— window, and watched the vessels sailing on the ——. Nearby, under the shelter of a —— tree, a fine —— horse, saddled, awaited the coming of the master. Far in the distance he could discern a stag standing at ——, while there came to him, borne on the breeze, the deep —— of his favorite hound.

31. Changed Heads

For first put down part of a chain;
Change head and then you'll find
A color neither black nor white
'Twill quickly bring to mind.

Change once again, you'll have a place
Where people sometimes skate;
Change head again, and this, I think,
Of some ships is the fate.

Change yet once more, it will display
A motion of the eye;
Change head—— But stop, this is enough;
I wish you all good-by!

32. Arrow Puzzle

Reading Downward: 1. In robbers. 2. A pronoun. 3. Vapor. 4. To hire. 5. Blossoms. 6. (Five letters) Darkness. 7. Fortune. 8. To unite. 9. Frequently. 10. A measure of weight. 11. Crude metal. 12. Nimble. 13. To daub. 14. A large, flat dish. 15. (Four letters) Extent. 16. (Two letters) Thus. From 1 to 2, the famous home of a famous outlaw.

33. Riddle

Fill the blanks with abbreviations of the names of States.

A pretty maid went out one day
To early ——, to —— her missal o'er;
Across a little —— she made her way,
With —— flowers strewn, as sweet as fabled——.
But as she passed a field of waving——
She met a young ——, and cried, "—— ——
—— you help ——? I feel so very ——.
My name is ——; take me home to ——."
The mischief's done; ere —— o'clock, I ——,
The youth had lost his heart to that sweet ——.

34. Anagrams

All of the groups of stars may be replaced by the same five letters, differently arranged.

A little boy wrote the following composition on his * * * * *.

Waterfowl

Certain waterfowl are called * * * * *. They feel bad if you * * * * * their eggs, but some folks are not in the * * * * * considerate; and many boys think the * * * * * about the wrong in robbing nests are very old and * * * * * and not worth heeding.

35. A Boat Riddle

Twelve kinds of boats are suggested in the following lines.

Behold a gallant fleet indeed;
Pray guess what they can be.

1. The first's the swiftest craft that sails,
   Though ne'er afloat is she.
   (Answer, ice-boat.)
2. The next appears as fleecy clouds
   In summer skies above.
3. And weapons sharp the third conceals,
   Beneath a velvet glove.
4. The shipwrecked man on desert isle
   The fourth would gladly see;
5. And in the fifth e'en gentle-folks
   Live for economy.
6. Handle the dangerous sixth with care;
7. The seventh with meats we use;
8. And if with dynamite you play,
   The eighth you're like to lose.
9. The ninth most college boys aspire
   To do both well and fast;
10. The tenth's a guide through dangerous ways
    And brings to port at last.
11. A narrow, winding, watery way
    Gives to the next its name;
12. The coarsest part of broken flax
    Does for the last the same.

36. A Cargo of Tea

Example: Take tea from a snare, and leave a blow. Answer, T-rap.

1. Take tea from a piece of furniture, and leave qualified. 2. Take tea from a legend, and leave a beverage. 3. Take tea from a money-box, and leave sick. 4. Take tea from a sharp pain, and leave a fireside. 5. Take tea from labor, and leave to lubricate. 6. Take tea from to drill, and leave a downpour. 7. Take tea from a cord, and leave a beverage. 8. Take tea from a quick pull, and leave a sorceress. 9. Take tea from part of a wheel, and leave wrath. 10. Take tea from sour, and leave science. 11. Take tea from disloyalty, and leave sense.

37. Puzzle Name

Her initials begin with an A;
She's an A at the end of her name;
The whole of her name is an A,
And 'tis backward and forward the same.

38. Transposed Trees

The letters in each of the words printed in italics may be transposed so as to form the name of a tree.

In a cabin a *mile north,* on the river *Wye,* lives old *Lem* with his pet *lamb*. *Clouts* of old rags fill the place of window-*panes* and door *panel.* Possessed of *ample* means, he *has* not *cared* to wear other covering than a ragged *dolman,* nor to drink from any but a *cheap* blue *mug*. At night he goes to *reap* the harvest of his *melon* patch. He will *take* a *lamp* in one hand to *allure* insects; and a *lump* of *rock* in the other, with which to slay a possible weasel.

CHARADES

1.

My *first* and *second* both mean the same,
Yet my *whole* a curious bird will name.

2.

My *first* is everything.
So is my *second.*
My *whole* is also.

3.

My *first* is to gather,
My *second* is used by a woodman,
My *whole* is a useful tool.

4.

To *first* at misfortune is *second third.*
My *whole* is worn by an Indian.

5.

When warm suns bring my *first* again,
My *second* will appear;
But many years have passed by since
My *whole* sailed over here.

6.

Sarah stood and to you beckoned:
"Come, our hoops we'll roll!"
Through my *first* you took my *second,*
And fell upon my *whole.*

7.

My *first* if you do, you won't hit;
My *next* if you do, you will have it;
My *whole* if you do, you won't guess it.

8.

My *first* you see in every church,
My *last* may make you sigh;
You are a faithful *whole,* I trust,—
I see it in your eye.

9.

My *first* is a shortening for a name;
My *second,* the middle of the same;
My *third* is a single part of a chain;
My *whole* is a bird that we hear in the lane.

10.

My *first* is reached in every race, since races first began;

My *second* is a smoky place, if in it there's a man;

My *third,* if spared, will spoil the child (than which no saying's truer);

My *whole* grows by the roadside wild: you've guessed it now, I'm sure.

11.

Between your eyes
My *first* one lies.

Merry with glee
My *second* you'll be.

Fragrant and sweet,
Behold me *complete.*

12.

In the calendar my *first* you will find;
My *second* is a song of some kind;
And my *whole* is a land
On the far southern strand.

13.

My *first* is in the negative;
My *second* rhymes with roll;
My *third* a preposition is;
A general's name, my *whole.*

14.

A consonant letter; the cry of a beast;
Combine; that is, if you can.
An island they'll name which once proved too small
To hold an illustrious man.

15.

In my *first* my *second* sings;
My *second* is a score of things;
My *whole* is not to peep or pry—
It simply asks the reason why.

16.

The boy sat by the fireside,
And stroked poor pussy's *second;*
Why should he *first* when asked to *whole?*
My *whole's* for nothing reckoned.

17.

My *first* is just beyond the gate;
My *second* egoists most use;
My *third* is oft the lookout's news;
My *whole* is called an island, though
I'm almost sure it is not so.

18.

Come, my *second,* in my *first;*
Here my puzzle is rehearsed.
Though my *whole* is small indeed,
It must serve my every need.

19.

My *first,* a royal personage,
May some day be a king;
My *second* many, many pounds,
Will make the balance swing.
My *whole* is a historic town—
I shall not tell you where;
If you're afraid of tigers
You'd better not go there.

20.

My *first* may spring from a gray goose wing;
A king is but my *second;*
Of the works of men my *third* has been
The bravest object reckoned.
And without my *first* my *whole* would be
A thing unknown to you and to me.

21.

You may search for my *whole* again and again,
But I fear you may have to wait;
My *first* and *second* you'll find at ten,
While my *third* and *fourth* you ate.

22.

My *first* is but a base deceit;
My *second's* hard and flinty;
My *whole* was brought from over seas
By Patrick O. McGinty.

23.

My *first* I have no sort of doubt
You will find it in, if you find it out.
My *second* will be already got
Whether you ever get it or not.
My *whole* is but a piece of metal,
But its use I will leave for you to settle.

24.

A useful thing you'll find my *first*
When you are hot and parched with thirst;
My *second* to us all is dear,
Especially if very near;
The printer's horror is my *third,*—
To him it is an awful word.
My *whole,* the joy of every heart,—
It comes with turkey, nuts, or tart.

25.

When children take their medicine
"Oh, tis my *first!*" they say,
And then my *second* they demand
To take the *first* away.
My *whole,* when frosty days have come,
Hangs bright in flame and gold,
As if it stored the sunshine up
To keep away the cold.

CONUNDRUMS

1. My first makes company,
My second shuns company,
My third assembles company,
My whole puzzles company.

2. Which are the two smallest things mentioned in the Bible?

3. What is that from which you may take away the whole and still have some left?

4. When a church is burning, what is the only part that stands no chance at all of being saved?

5. What is that which lives in winter, dies in summer, and grows with its root upward?

6. What 'bus found room for the greatest number of people?

7. Which is heavier, a half or a full moon?

8. What is the difference between a man going up stairs and one looking up the stairs?

9. What is the difference between Niagara Falls and Queen Elizabeth?

10. Why is it easy to break into an old man's house?

11. In what place did the cock crow so loud that all the world heard him?

12. When did Moses sleep five in a bed?

13. Why does a Russian soldier wear brass buttons on his coat, and an Austrian soldier wear steel ones?

14. Who are the two largest ladies in the United States?

15. Why is modesty the strongest characteristic of a watch?

16. Why is it more dangerous to go out in the spring than at any other season of the year?

17. Who was the first boy mentioned in the Bible?

18. Who was the first girl mentioned in the Bible?

19. What makes everybody sick but those who swallow it?

20. What two animals carried the least into the ark?

21. When is charity like a top?

22. Why is a thief very comfortable?

23. What is that which by losing an eye has nothing left but a nose?

24. What is that which is full of holes and yet holds water?

25. What was the difference between Joan of Arc and Noah's Ark?

26. What is the difference between the Prince of Wales and the water in a fountain?

27. Why is a wise man like a pin?

28. When is it dangerous to enter a church?

29. How can a man make his money go a long way?

30. What is the difference between a hill and a pill?

31. When is money damp?

32. What is that which you break by even naming it?

33. Why are bells the most obedient of inanimate things?

34. What is the most awkward time for a train to start?

35. A man and a goose once went up in a balloon together, the balloon burst and they landed on a church steeple; how did the man get down?

36. How can you spell Adam's Express Company with three letters?

37. Why is Philadelphia more subject to earthquakes than any other city?

38. What would contain all the snuff in the world?

39. What is the oldest table in the world?

40. What three authors' names might you think of if you were watching a house burn down?

41. I went out walking one day and met three beggars; to the first I gave ten cents, to the second also I gave ten cents, and to the third I gave but five; what time of day was it?

42. Why is a buckwheat-cake like a caterpillar?

43. What is the difference between a farmer and a seamstress?

44. What is the difference between one yard and two yards?

45. What is the brightest idea in the world?

46. What animal drops from the clouds?

47. What is more wonderful than a horse that can count?

48. Why is Athens like a worn-out shoe?

49. What is the most difficult river on which to get a boat?

50. Why is a lady who faints in a public place like a good intention?

51. Why are your eyes like friends separated by the ocean?

52. Why may a beggar wear a very short coat?

53. What man mentioned in the Bible had no father?

54. Show that twice ten is equal to twice eleven.

55. What is the difference between a fisherman and a lazy schoolboy?

56. Which is the hardest of all soaps?

57. What is the difference between some foolish women and their looking-glasses?

58. Why is a false friend like the letter P?

59. What is the difference between a spendthrift and a pillow?

60. Which is more valuable, a five-dollar note or five gold dollars?

61. If all the seas were dried up, what would old Neptune say?

62. What is the difference between an old penny and a new dime?

63. Why was Eve not afraid of the measles?

64. What is the keynote to good manners?

65. Why is a four-quart jar like a lady's saddle?

66. Why is divinity an easier profession than medicine?

67. What is it we all frequently say we will do and no one has ever yet done?

68. What word of only three syllables combines in it twenty-six letters?

69. What is the difference between a dog's tail and a rich man?

70. Why is a lame dog like a school boy adding six and seven together?

71. Why is a baker a most improvident person?

72. When is a man obliged to keep his word?

73. A duck before two ducks, a duck behind two ducks, and a duck between two ducks; how many ducks were there in all?

74. At what time of day was Adam created?

75. Why is a college student like a thermometer?

76. If a bear were to go into a dry-goods store, what would he want?

77. What is the difference between a gardener and a Chinaman?

78. Why is B like a hot fire?

79. Why is a little dog's tail like the heart of a tree?

80. Who is it that always has a number of movements on foot for making money?

81. What is the first thing a man plants in his garden?

82. When may bread be said to be alive?

83. Why is coal the most contradictory article known to commerce?

84. What is the difference between a watchmaker and a jailer?

85. Why is it that whenever you are looking for anything you always find it in the last place you look?

86. What is that which you cannot hold five minutes although it is as light as a feather?

87. What is the greatest number of fathers that a man may possibly have?

88. Why is the Fourth of July like an oyster?

89. If a two-wheeled wagon is a bicycle, and a three-wheeled wagon is a tricycle, what would you call a five-wheeled one?

90. What is it that is as old as the world, destined to live as long as the world, and yet never is five weeks old?

91. What table has no legs to stand upon?

92. Who is the oldest lunatic on record?

93. Why does a balloonist dislike to speak about his trips?

94. Why is an umbrella a paradox?

95. Why is a water-lily like a whale?

96. Which are the two most disagreeable letters if you get too much of them?

97. What is the difference between a young lady of eighteen and an old lady of eighty?

98. Why is it vulgar to sing and play by yourself?

99. Why is a shoemaker the most industrious of men?

100. When is a tradesman above his business?

101. Why are watch-dogs bigger by night than by day?

102. Why was Noah like a hungry cat?

103. Why is a washerwoman like a navigator?

104. What words may be pronounced quicker and shorter by adding another syllable to them?

105. Why is a madman like two men?

106. Why was the first day of Adam's life the longest?

107. What was it a blind man took at breakfast which restored his sight?

108. Why is a pair of skates like an apple?

109. Why are deaf people like Dutch cheeses?

110. Why need a traveler never starve in a desert?

111. Why is a pig in a parlor like a house on fire?

112. What is the difference between a soldier and a bombshell?

113. Why are fowls the most economical things a farmer can keep?

114. Why is it dangerous to sleep in a train?

115. What lives upon its own substance and dies when it has devoured itself?

116. Which is the left side of a plum pudding?

117. Which letter of the alphabet is necessary to make a shoe?

118. Why is a fish dealer never generous?

119. What grows less tired the more it works?

120. If a man who is carrying a dozen lamps drops one, what does he become?

121. What is that which works when it plays and plays when it works?

122. When has a man four hands?

123. What is the difference between a schoolmaster and an engineer?

124. Why is a watch like a river?

125. A man had twenty sick (six) sheep and one died; how many were left?

126. Why is a spider a good correspondent?

127. Which is the smallest bridge in the world?

128. Why is the letter S like thunder?

129. What is the difference between a mother and a barber?

130. What is the difference between an auction and seasickness?

131. What lesson of life can the small boy learn from the fire engine?

132. Which is easier to spell—fiddle-de-dee or fiddle-de-dum?

133. Why are pianos noble characters?

134. Why is it probable that beer was made in the Ark?

135. Why is a watch the most difficult thing to steal?

136. What is that which the more you take from it the larger it grows?

137. Why should a man always wear a watch when he travels in a desert?

138. What relation is a door-mat to a door?

139. When is the best time to get a fresh egg at sea?

140. Why does a sculptor die a most horrible death?

141. When is a hairdresser to be pitied?

142. When is the worst weather for rats and mice?

143. When are two apples alike?

144. What is the difference between a blind man and a sailor in prison?

145. What is that which comes twice in a moment and not once in a thousand years?

146. Which is the longest word in the English language?

147. What is that which never asks any questions and yet requires many answers?

148. Why did William Tell shudder when he shot the apple from his son's head?

149. Why is C like a school-teacher?

150. What is worse than raining cats and dogs?

151. What is the difference between soldiers and flowers?

152. What is there remarkable about a bee?

153. Why is a poor acquaintance better than a rich one?

154. What part of the face resembles a harsh schoolmaster?

155. When is a doctor most annoyed?

156. What is the center of gravity?

157. What is the difference between a milkmaid and a swallow?

158. Why was the giant Goliath very much astonished when David hit him with a stone?

159. When was paper currency first spoken of in the Bible?

160. What is the difference between a cloud and a whipped child?

161. Why is life the greatest of all conundrums?

162. Why is a young lady like a sheaf of wheat?

163. What relation is a child to its father that is not its father's own son?

164. What sea would make a good bedroom?

165. In what place can happiness always be found?

166. How much earth is in a hole $3\frac{1}{4} \times 6\frac{1}{2}$ ft.?

167. Why is a Christmas pudding like an ocean?

168. Which are the most difficult ships to conquer?

169. What color would you paint the wind and the rain?

170. If the alphabet were invited out, what time would u, v, w, x, y and z go?

171. What is the difference between a cat and a comma?

172. Why does a horse eat in a very odd way?

173. What single word asks the question, "Am I fit?"

174. Why is Ireland likely to become very rich?

175. Why should you never tell secrets in a cornfield?

176. If a man falls from the roof of a house, what does he fall against?

177. Tom went out, and his dog went with him; the dog went not before, nor behind, nor on one side of him; where did he go?

178. Why are fish well educated?

179. What is the difference between a light in a cave and a dance in an inn?

180. When is a man over head and ears in debt?

181. Why is O the noisiest of the vowels?

182. Why is a mouse like a hayrick?

183. Which are the three most useful letters for a man of business?

184. What is it that is neither useful nor ornamental, and yet a carriage cannot go without it?

185. When did George Washington first take a carriage?

186. What insect does a blacksmith manufacture?

187. Why does a freight car need no locomotive?

188. Why is a prince's musing on his parents' government like a rainbow?

189. Why is an empty purse expressive of constancy?

190. When is a fowl's neck like a bell?

191. What is it that you can keep even after giving it to some one else?

192. Why are dealers in glassware unlike all other merchants?

193. Why is an orange like a church belfry?

194. When is a gun like a dismissed servant?

195. Why is early grass like a penknife?

196. What kind of a cat do we usually find in a large library?

197. What cord is that which is full of knots, yet which no one can tie or untie?

198. Why is a chicken pie like a store in which guns are sold?

199. Why is a field of grass like a person older than yourself?

200. Why is a person reading these conundrums like a man condemned to undergo a military execution?

ANSWERS TO RIDDLES, CHARADES, AND CONUNDRUMS

ANSWERS TO RIDDLES

1. A well.
2. D, O, L, L; doll.
3. Tongs.
4. Bark.
5. The teeth.
6. A milkweed pod.
7. A candle.
8. An egg.
9. A splinter.
10. Ann.
11. There was but one girl, Elizabeth. The other three names are only nicknames.
12. An m on E, Anemone.
13. A pin and a needle.
14. Too wise you are,
    Too wise you be;
    I see you are
    Too wise for me.
15. Q-bit, queue, bit; cubit
16. An'drew; Andrew.
17. A table.
18. A man sat upon a three-legged stool with a leg of mutton in his lap. In came a dog and ran away with the mutton; up jumped the man and threw the stool after the dog who brought back the mutton.
19. You sigh for a cipher, but I sigh for thee;
    Oh! sigh for no cipher, but oh! sigh for me;
    Then let my cipher thy cipher be;
    And give sigh for sigh, for I sigh for thee.
20. 4, IV, Ivy.
21. VI, king; Viking.
22. Scales.
23. Time, thyme.
24. Perch.
25. Craft.
26. Bar.
27. Reign, rain, rein.
28. Flag.
29. Plane, plain.
30. Queue, you, eye, ell, tea; Quilt.
31. Cloth.

ANSWERS TO ALL SORTS OF PUZZLES

1. Omitted Letters. Vacation.
2. A Hive of Bees. 1. B-rag. 2. B-ill. 3. B-read. 4. B-end. 5. B-risk. 6. B-eat. 7. B-ark. 8. B-lack. 9. B-low.
3. A Puzzle in Numbers.
   C-o-l-d; cold.
4. Forward and Backward.
   I. Drab, bard. II. Yew, Wey.
5. Singular and Plural. 1. No, nose. 2. May, maze. 3. Add, adze. 4. Fur, furze. 5. Few, fuse. 6. Gay, gaze. 7. Brew, bruise. 8. Core, coarse. 9. Mew, muse. 10. Dough, doze.
6. Double Diagonals. Rob Roy.
   1. Ray. 2. Woo. 3. Rib.
7. Alliterations. 1. S. D. T. 2. F. P. B. 3. G. C. S. 4. Q. L. C. 5. B. S. T.
8. Changed Heads.
   Bat, cat, eat, fat, hat, mat, oat, pat, rat, sat, vat.
9. Additions. 1. Rub-y. 2. Boot-y. 3. Ma-y. 4. Shad-y. 5. Lad-y.
10. Letter Words. 1. Dee. 2. Jay. 3. Yew. 4. Tea. 5. Bee. 6. Pea. 7. Eye. 8. Queue. 9. Sea. 10. Ell. 11. You. 12. Gee.

11. Additions. B-o-a-r-d.

12. Transformations. 1. Tea-l. 2. Sea-l. 3. Pea-l. 4. Cow-l. 5. Bow-l.

13. A Curious Word. Pl-ague.

14. A Story in Rhyme. Nate, skate, relate, Kate, obstinate, fate, pate, intimate, slate, exaggerate, hate, exasperate, state, straight, rate, wait, gate, prate, late, eight, great, irate, desperate, tête-à-tête.

15. A Swarm of Bees. 1. Bale. 2. Blubber. 3. Bone. 4. Bowl. 5. Bracket. 6. Bear. 7. Brain. 8. Brake. 9. Branch. 10. Bream. 11. Blast. 12. Brick. 13. Brill. 14. Bloom. 15. Block. 16. Brook. 17. Broom. 18. Brush. 19. Bruin. 20. Brogue. 21. Bray. 22. Ball.

16. Ten Curious Berries. 1. Strawberry. 2. Blackberry. 3. Raspberry. 4. Gooseberry. 5. Checkerberry. 6. Mulberry. 7. Blueberry. 8. Partridge-berry. 9. Barberry. 10. Elderberry.

17. A Riddle of Trades.
1. Tanner. 2. Joiner. 3. Turner. 4. Mason (May-sun). 5. Goldsmith. 6. Shoemaker. 7. Cabinet-maker. 8. Wheelwright. 9. Fuller. 10. Printers. 11. Tinker (Tincur). 12. Hairdresser.

18. Omitted Fruits.
1. Apple. 2. Pear.

19. Mr. Brown's Family.
Seven; six daughters and one son.

20. Seven Nuts. 1. Chestnut. 2. Cocoanut. 3. Butternut. 4. Beechnut. 5. Walnut. 6. Peanut. 7. Doughnut.

21. The Race of Years.
The father was forty-five, and his son fifteen. In fifteen years, when the son is thirty, the father will be sixty years old.

22. Dropped Letters.
Ne-g-ro, Nero.

23. Rhyming Blanks. Roan, crone, stone, groan, moan, blown, thrown, prone, tone, lone, own, none, mown, zone, grown, bone, shone, cone, strown, flown, throne.

24. Twenty Trees. 1. Plum. 2. Peach. 3. Lime. 4. Elder. 5. Pine. 6. Bay. 7. Ash. 8. Fir. 9. Cork. 10. Yew. 11. Plane. 12. Bass. 13. Spruce. 14. Palm. 15. Pear. 16. Box. 17. Gum. 18. Beech. 19. Locust. 20. Sandal.

25. Riddle. A stocking.

26. The Squirrel and the Corn. Each day he removes one ear of corn and his own two ears as well.

27. Changed Initials. Cap, nap, gap, sap, hap, map, lap, pap, rap, tap.

28. The Diner's Reply. I ate next to nothing.

29. Missing Words. Christmas, chill, hill, rill, ill, still, thrill, mill, achill, shrill.

30. Omitted Word. Bay.

31. Changed Heads.
Link, pink, rink, sink, wink.

32. Arrow Puzzle. From 1 to 2, Sherwood Forest. 1. S. 2. She. 3. Steam. 4. Charter. 5. Flowers. 6. Gloom. 7. Lot. 8. Add. 9. Oft. 10. Ton. 11. Ore. 12. Fleet. 13. Plaster. 14. Platter. 15. Area. 16. So.

33. Riddle. Mass., Conn., Del., Ga., Ind., R. I., Md., O., La., Kan., Me., Ill., Ida., Pa., Tenn., Wis., Miss.

34. Anagrams. Slate, teals, steal, least, tales, stale.

35. A Boat Riddle. 1. Ice-boat. 2. Steam-boat. 3. Cat-boat. 4. Sail-boat. 5. Flat-boat. 6. Gunboat. 7. Gravy-boat. 8. Life-boat. 9. Row-boat. 10. Pilot-boat. 11. Canal-boat. 12. Tow-boat.

36. A Cargo of Tea. 1. T-able. 2. T-ale. 3. T-ill. 4. T-ingle. 5. T-oil. 6. T-rain. 7. T-wine. 8. T-witch. 9. T-ire. 10. T-art. 11. T-reason.

37. Puzzle Name. Anna.

38. Transposed Trees. 1. Lime. 2. Thorn. 3. Yew. 4. Elm. 5. Balm. 6. Locust. 7. Aspen. 8. Plane. 9. Maple. 10. Ash. 11. Cedar. 12. Almond. 13. Peach. 14. Gum. 15. Pear. 16. Lemon. 17. Teak. 18. Palm. 19. Laurel. 20. Plum. 21. Cork.

PUZZLE PICTURES

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Name the Plants. 1. Cabbage. 2. Dog-rose. 3. Larkspur. 4. Apricot. 5. Orchids. 6. Hollyhock. 7. Box. 8. Foxglove. 9. Heartsease. 10. Gooseberry.

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What the Boys and Girls Are Doing. 1. Digging. 2. Playing the piano. 3. Building a castle in the sand. 4. Swinging. 5. Flying a kite. 6. Leaping a gate. 7. Using

a cricket bat. 8. Jumping. 9. Kicking a football. 10. Writing. 11. Throwing a ball. 12. Pulling a lawn-roller. 13. Spinning a peg-top. 14. Fishing. 15. Rolling a hoop. 16. Playing leap frog.

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TO WHAT ANIMALS DO THESE BELONG? 1. Human. 2. Dog. 3. Stork. 4. Tiger. 5. Rat. 6. Cat. 7. Deer. 8. Crow. 9. Child. 10. Cock. 11. Duck. 12. Rabbit. 13. Horse. 14. Monkey. 15. Cow.

ANSWERS TO CHARADES

1. Do-do.
2. All, so; also.
3. Pick-ax.
4. Mock, a, sin; moccasin.
5. May-flower.
6. Door-step.
7. Miss, take; mistake.
8. Pew, pill; pupil.
9. Bob-o-link.
10. Goal, den, rod; goldenrod.
11. Nose-gay.
12. May, lay; Malay.
13. Nay, pole, on; Napoleon.
14. L, baa; Elba.
15. In, choir, quire; inquire.
16. Sigh, fur; cipher.
17. Road, I, land; Rhode Island.
18. In-come.
19. Prince-ton.
20. Pen-man-ship.
21. At, ten, you, ate; attenuate.
22. Sham-rock.
23. In-got.
24. Pump, kin, pi; pumpkin pie.
25. Bitter-sweet.

ANSWERS TO CONUNDRUMS

1. Co-nun-drum.
2. The widow's mite and the wicked flee (flea).
3. The word whole-some.
4. The organ; because the engine cannot play upon it.
5. An icicle.
6. Colum-bus.
7. The half; because the full moon is as light again.
8. One is stepping up the stairs, the other staring up the steps.
9. One is a wonder, the other is a Tudor.
10. Because his gate (gait) is broken and his locks are few.
11. In the ark.
12. When he slept with his forefathers.
13. To keep his coat buttoned.
14. Miss Ouri and Mrs. Sippi (Missouri and Mississippi).
15. Because it always keeps its hands before its face, and runs down its own works.
16. Because in the spring the grass has blades, the flowers have pistils, the leaves shoot, and the bulrushes out.
17. Chap. 1.
18. Jennie Sis (Genesis).
19. Flattery.
20. The fox and cock, because they carried only a brush and comb between them.
21. When it begins to hum.
22. Because he usually takes things so easy.
23. No-i-se.
24. A sponge.
25. One was Maid of Orléans, the other was made of wood.
26. One is heir to the throne, the other, thrown to the air.
27. He comes to a point and has a head which prevents him from going too far.
28. When there is a canon in the reading-desk, a great gun in the pulpit, and a bishop charges the congregation.
29. By contributing to foreign missions.
30. One is hard to get up, the other is hard to get down.
31. When it is due in the morning and missed at night.
32. Silence.

33. Because they make a noise whenever they are told (tolled).

34. At 12.50, as it's ten to one if you catch it.

35. Plucked the goose.

36. E-v-e.

37. Because she is a Quaker city.

38. No one nose (knows).

39. The multiplication table.

40. Dickens, Howitt, Burns.

41. A quarter to three.

42. Because it is the grub that makes the butter-fly.

43. One gathers what he sows, the other sews what she gathers.

44. A fence.

45. Your eye, dear.

46. The rain, dear (reindeer).

47. A spelling bee.

48. Because it once had a Solon (sole on).

49. Arno, because they're Arno boats there.

50. Because she needs carrying out.

51. Because they correspond but never meet.

52. Because it will be long enough before he gets another.

53. Joshua, the son of Nun.

54. Twice ten is twenty, and twice eleven is twenty-two (twenty, too).

55. One baits his hook, the other hates his book.

56. Cast steel (Castile).

57. The former talk without reflecting, the latter reflect without talking.

58. Because, although always first in pity, he is always last in help.

59. One is hard up, the other is soft down.

60. The note, because when you put it in your pocket you double it, and when you take it out again you see it increases.

61. I really haven't an ocean (a notion).

62. Nine cents.

63. Because she'd Adam (had 'em).

64. B natural.

65. Because it holds a gal-on (gallon).

66. Because it is easier to preach than to practise.

67. Stop a minute.

68. Alphabet.

69. One keeps a waggin' (wagon) and the other keeps a carriage.

70. Because they both put down three and carry one.

71. Because he is continually selling that which he needs (kneads) himself.

72. When no one will take it.

73. Three.

74. A little before Eve.

75. Because he is graduated and marked by degrees.

76. He would want muzzlin' (muslin).

77. One keeps the lawn wet, the other keeps the lawn dry (laundry).

78. Because it makes oil boil.

79. Because it's farthest from the bark.

80. A dancing master.

81. His foot.

82. When it has a little Indian in it.

83. Because when purchased, instead of going to the buyer it goes to the cellar (seller).

84. One sells watches and the other watches cells.

85. Because you always stop looking when you find it.

86. Your breath.

87. Nine: his father, his godfather, his father-in-law, his two grandfathers, and his fore- (four) fathers.

88. Because we cannot enjoy it without crackers.

89. A V-hicle, of course.

90. The moon.

91. The multiplication table.

92. Time out of mind.

93. It is generally a soar (sore) point with him.

94. Because it is best when used up.

95. Because they both come to the surface to blow.

96. K N (cayenne).

97. One is happy and careless, and the other is cappy and hairless.

98. Because it is so low (solo).

99. Because he works to the last.

100. When he lives over his shop.

101. Because they are let out every night and taken in every morning.

102. Because he went forty days and forty nights without finding Ararat (e'er a rat).

103. Because she spreads her sheets, crosses the line and goes from pole to pole.

104. Quick and short.

105. Because he is a man beside himself.

106. Because it had no Eve.

107. He took a cup and saw, sir (saucer).

108. Because they have both occasioned the fall of man.

109. Because you can't make them hear (here).

110. Because of the sand which is (sandwiches) there.

111. Because the sooner it is put out the better.

112. One goes to wars and the other goes to pieces.

113. Because for every grain they give a peck.

114. Because every train runs over all the sleepers on the line.

115. A candle.

116. The side that is left.

117. The last.

118. Because his business makes him sell fish (selfish).

119. A carriage wheel.

120. A lamp lighter.

121. A fountain.

122. When he doubles his fists.

123. One trains the mind and the other minds the train.

124. Because it doesn't run long without winding.

125. Nineteen.

126. Because he drops a line at every post.

127. The bridge of your nose.

128. It makes our cream sour cream.

129. The latter has razors to shave and the former has shavers to raise.

130. One is a sale of effects, the other, the effects of a sail.

131. It must work or it can't play.

132. Fiddle-de-dee, because it is spelled with more "e's."

133. Because they are grand, upright, and square.

134. Because the kangaroo went in with hops, and the bear was always bruin (brewin').

135. Because it is seldom off its guard.

136. A hole.

137. Because every watch has a spring in it.

138. A step-father (farther).

139. When the ship lays to (two).

140. Because he makes faces and busts.

141. When he curls up and dyes.

142. When it rains cats and dogs.

143. When pared (paired).

144. One cannot see to go and the other cannot go to sea.

145. The letter M.

146. Smiles; because there is a mile betweer the first and last letters.

147. The door-bell.

148. Because it was an arrow (a narrow) escape for his child.

149. Because it forms lasses into classes.

150. Hailing omnibuses.

151. The flowers can shoot before they have pistils (pistols); but the soldiers cannot.

152. It has nothing to say but it generally carries its point.

153. Because a friend in need is a friend indeed.

154. The eyelid, because it always has a pupil under the lash.

155. When he is out of patients.

156. The letter V.

157. The milkmaid skims the milk, the swallow skims the water.

158. Because such a thing had never entered his head before.

159. When the dove brought the green back to Noah.

160. One pours with rain, the other roars with pain.

161 Because all must give it up.

162. First she is cradled, then thrashed, and finally she becomes the flower (flour) of the family.

163. Daughter.

164. Adriatic (a dry attic).

165. In the dictionary.

166. None.

167. Because it contains many currants (currents).

168. Hardships.

169. The wind rose and the rain blew (blue).

170. After tea (T).

171. A cat has its claws at the end of its paws; a comma, its pause at the end of a clause.

172. Because he eats best when he has not a bit in his mouth.

173. Amiable (am I able?).

174. Because its capital is always Dublin (doublin').

175. Because the corn has ears and is bound to be shocked.

176. His will.

177. On the other side.

178. Because they have a taste for going in schools.

179. One is a taper in a cavern, the other a caper in a tavern.

180. When he owes for his wig.

181. Because it is necessary to a loud noise, and all the other vowels are inaudible (in audible).

182. Because the cat'll (cattle) eat it.

183. N. R. G. (energy).

184. A noise.

185. When he took a hack at the cherry-tree.

186. He makes the fire-fly.

187. Because the freight makes the cargo (car go).

188. Because it is the son's (sun's) reflection on the reign (rain).

189. Because you find no change in it.

190. When it is wrung (rung) for dinner.

191. Your word.

192. Because it will not do for them to crack up their goods.

193. Because we have a peel (peal) from it.

194. When it is discharged and goes off.

195. Because the spring brings out the blades.

196. A cat-alogue.

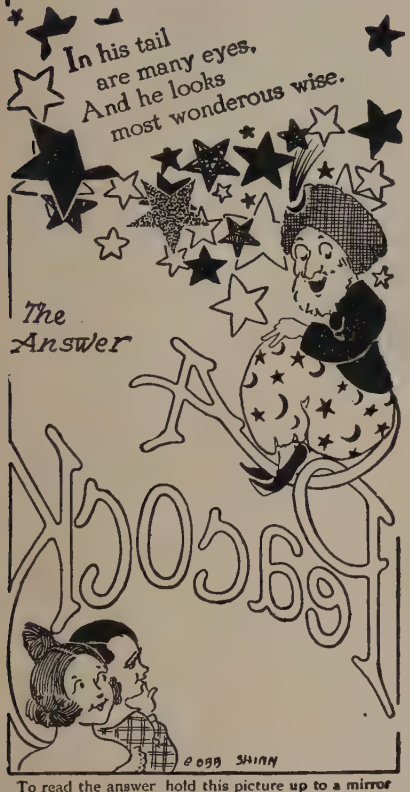
197. A cord of wood.

198. Because it contains fowl in pieces (fowlin' pieces).

199. Because it is pasturage (past your age).

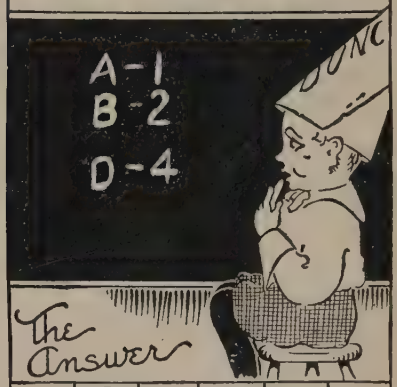
200. Because he is pretty sure to be riddled to death.

Riddles and Puzzles
Tricks and Stunts



To read the answer hold this picture up to a mirror

The grocer
could not do without,
Fish have me by the score,
Folks come to me
when they're in doubt,
I weigh a pound - or more.



S	C	A	L	E	S
19	3	1	12	5	19

The numbers stand for the letters of the alphabet. A is one, B is two and so on.

MAGIC DOTS

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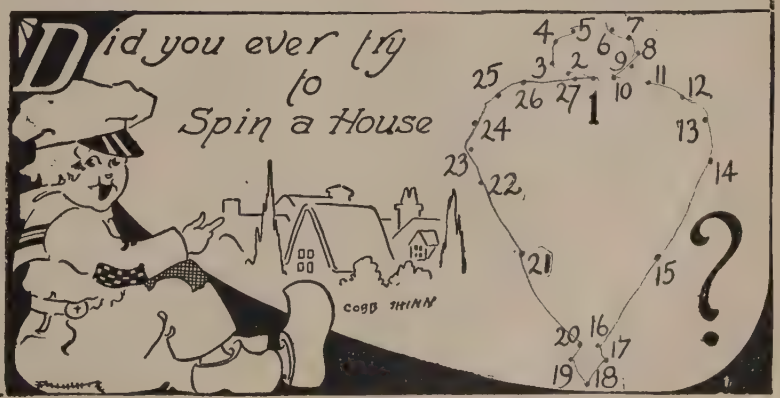
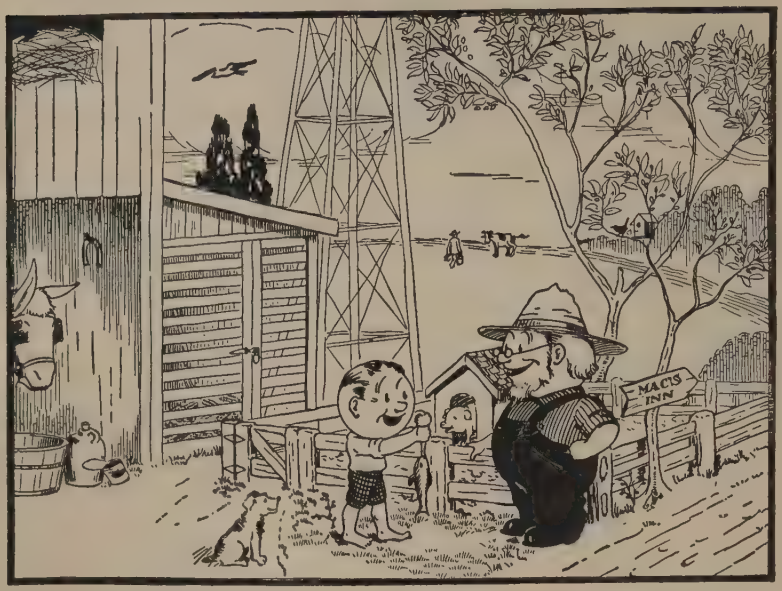
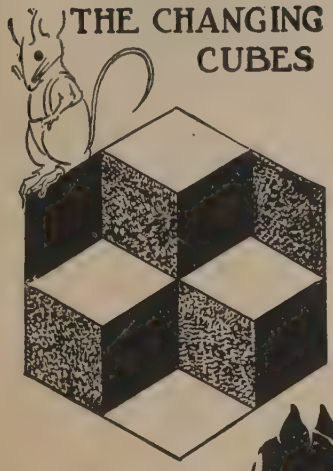


How many rhyming words does this picture suggest?



THE CHANGING CUBES



First it looks as if there was one cube resting on two cubes. Close your eyes a moment, then look again. They have changed.

The Key Words are Pen, Inn, and Sign

WHAT WILL HAPPEN?

Lay a bottle on its side. Place a loosely fitting cork from a smaller bottle in the neck. Then try to blow the cork into the bottle.

The cork will fly back and hit you in the face. Because, the bottle is already filled with air and the air which you blow into the bottle will have to come out, and at the same time it will force the cork out of the bottle.

Big at the top
Little below
With the center
As cold as snow.

The Answer

AcrNeam IcoCneE

To read the answer, read the capital letters first, then start over again and read the small letters.

What goes to sleep,
in a silken cover,
And wakes to find
itself changed all over?

The Answer

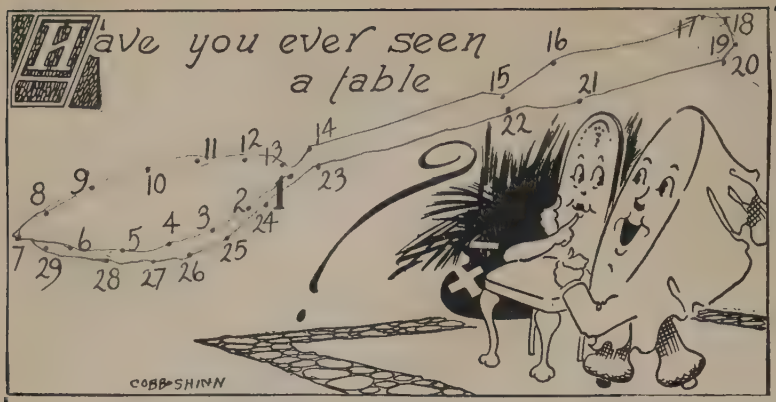
T	H	E
20	8	5

C	A	T	e	r	P	i	L	L	A	R
3	1	20	5	18	16	9	12	12	1	18

The numbers stand for the letters of the alphabet. A is one, B is two and so on.

How many rhyming words does this picture suggest?

The Key Words
are
Hair and Breeze



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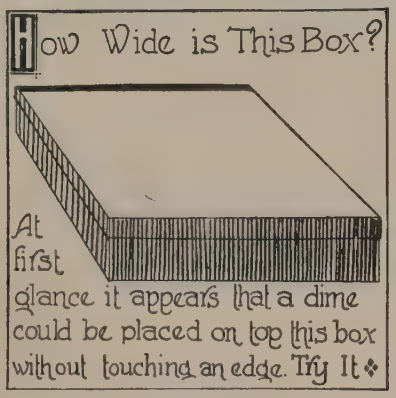
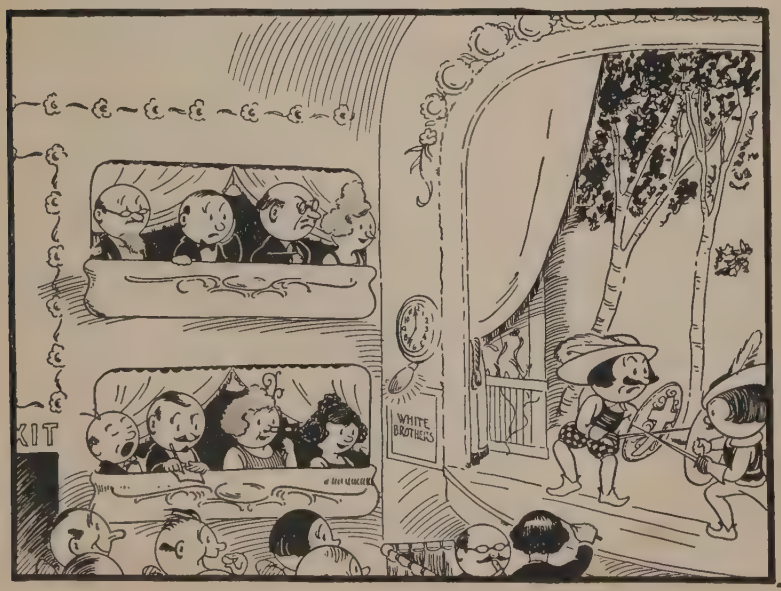


A TRICK with a SPOON
To accomplish this trick you must secretly rub your finger and thumb on cloth to remove all dampness and grease.

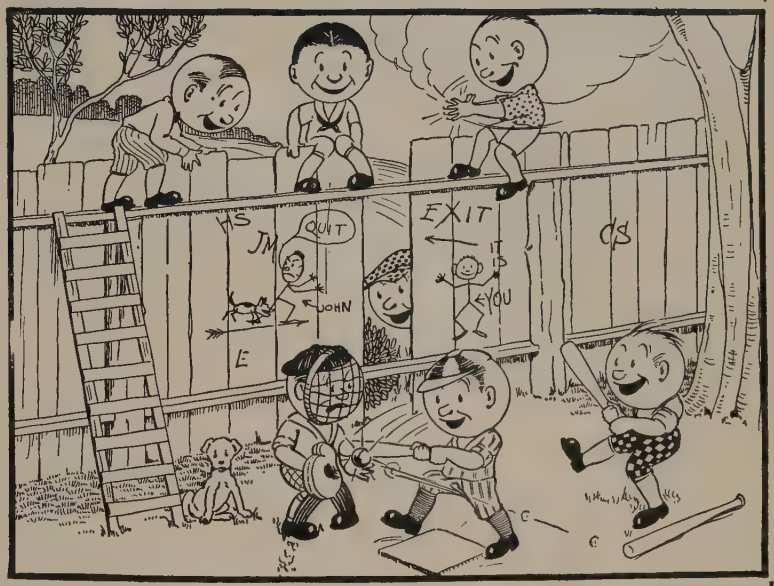
How many rhyming words does this picture suggest?



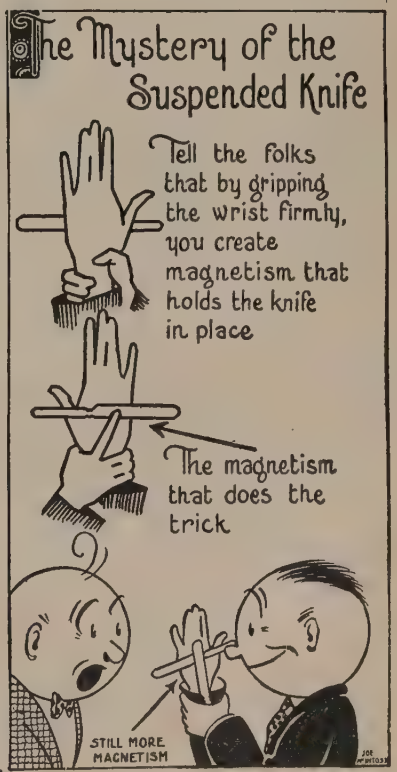
The Key Words are Fight and Sword

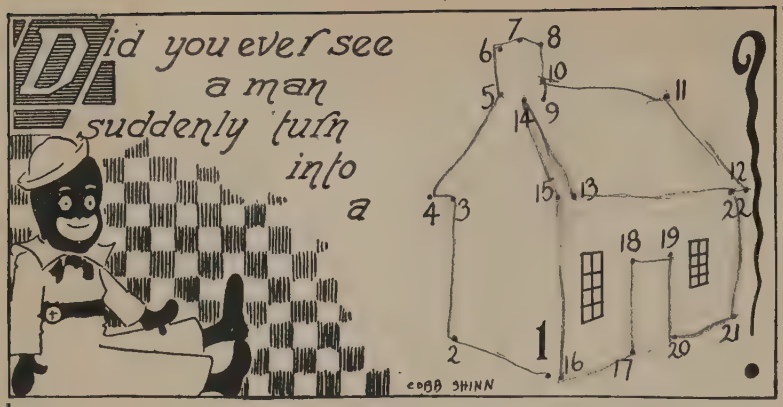
How many rhyming words does this picture suggest?

The Key Words
are
Hit and Cloud



To read the answer, read from right to left, the answer is just backwards.





MAGIC DOTS

To find the answer put a piece of thin paper over the illustration and draw a continuous line from dot 1 to dot 2 to dot 3, etc.

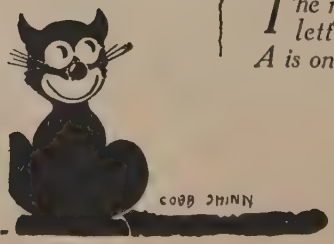
What runs in and out
From under your hat,
Quicker than you
Can even say, "Scatt."

T	H	O	Y	G	A	T
20	8	15	21	7	8	20

The numbers stand for the letters of the alphabet. A is one, B is two and so on.

Pick up ten matches by only touching one. Place the matches in this manner.

Try this trick on your friends.



AN ILLUSION TRICK

MAKE TWO LINES THE SAME LENGTH PLACE FOUR MATCHES ON THEM IN THIS MANNER

ASK SOMEBODY WHICH IS THE LONGER LINE

AFTER THEY HAVE GUESSED REMOVE THE MATCHES

COBB SHINN

I have four legs that cannot move
And a head that walks away.
I have two leaves that do not grow
Though I've food three times a day.

The Answer

D	I	N	I	N	G
4	9	14	9	14	7

T	A	B	L	E
20	1	2	12	5

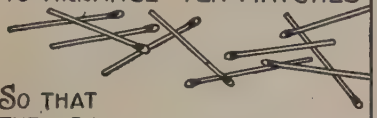
The numbers stand for the letters of the alphabet. A is one, B is two and so on.

How many rhyming words does this picture suggest?

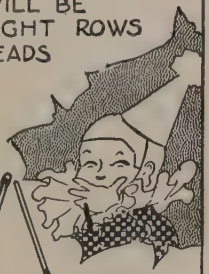
The Key Words
are
Scale and Weigh

TO KEEP YOUR FRIENDS GUESSING

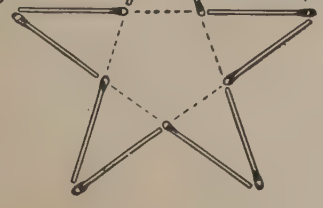
ASK ONE OF THEM TO ARRANGE TEN MATCHES



SO THAT THE HEADS WILL BE IN FIVE STRAIGHT ROWS WITH FOUR HEADS IN EACH ROW



The Solution



COBB SHINN

A VERY ODD NAME! BECAUSE IF YOU TURN IT

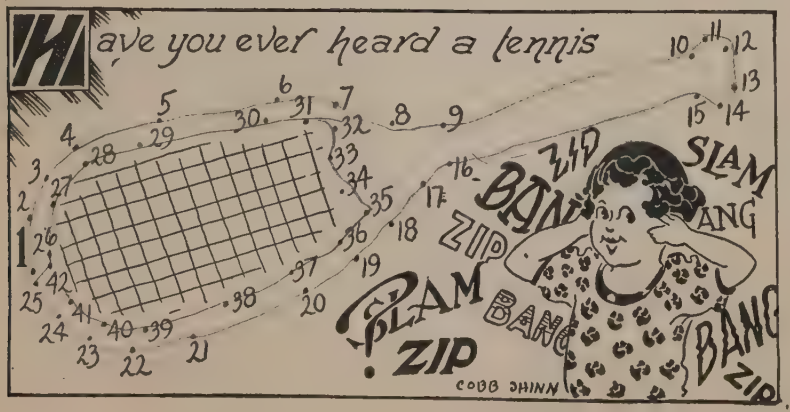
UP-SIDE-DOWN
IT STILL
READS THE SAME
W. H. HILL

W. H. Hill

PUT THREE PIGS IN FOUR PENS

EASY

COBB SHINN



MAGIC DOTS

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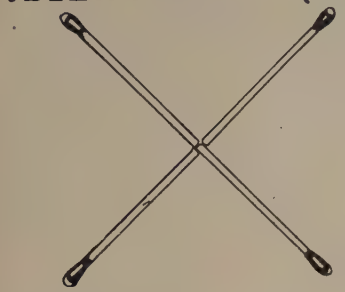
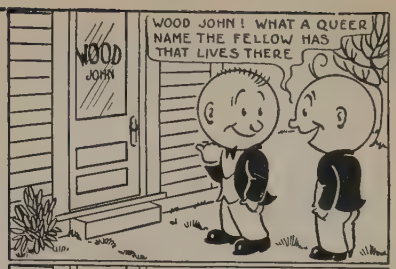
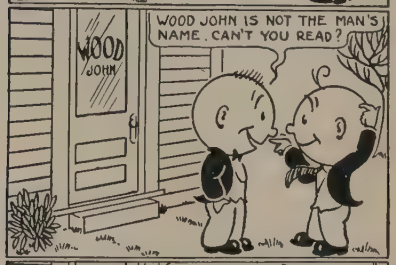
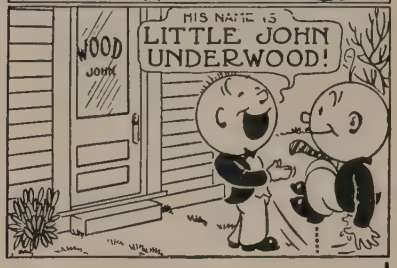
MOVE ONE MATCH *and* MAKE A PERFECT SQUARE



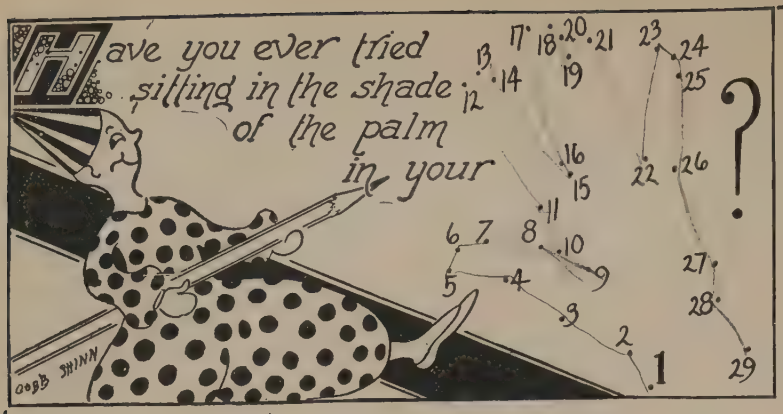






How many rhyming words does this picture suggest?

The Key Words
are
Kick and Pail



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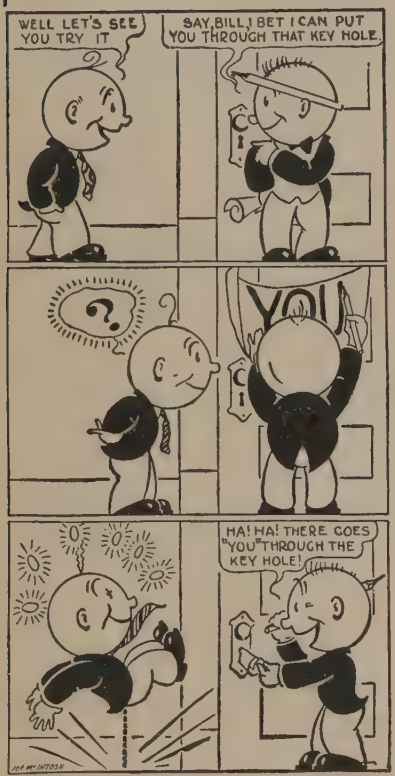
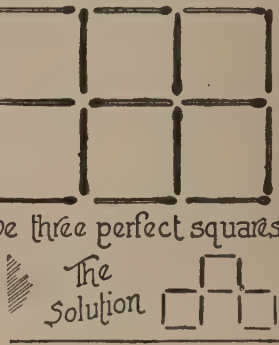

WELL LET'S SEE YOU TRY IT
SAY, BILL, I BET I CAN PUT YOU THROUGH THAT KEY HOLE
?
YOU
HA! HA! THERE GOES "YOU" THROUGH THE KEY HOLE!
JOE McINTOSH

SEVENTEEN MATCHES

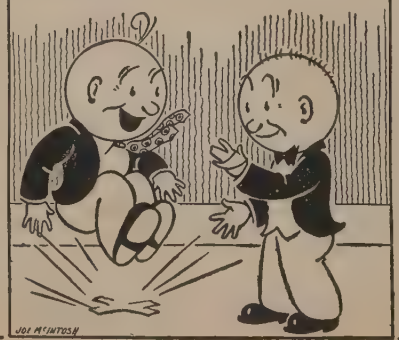
Take away five of them and leave three perfect squares



The Solution

A NEW TRICK TO TRY

First put a rubber band on your hand, as shown in the illustration, then try to get it off following these rules: The hand must not touch anything while you are trying to free it from the rubber band. The right hand must not assist in getting the rubber off by twisting the fingers or contracting the muscles of the other hand.



LOOKS IMPOSSIBLE

PLACE
FIVE
MATCHES
ON A PLATE
ASK
FIVE PEOPLE
TO EACH
TAKE A MATCH
YET LEAVE ONE ON THE PLATE

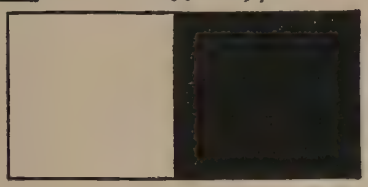
The Solution

THE LAST PERSON
TO PICK UP A MATCH
TAKES PLATE
AND ALL

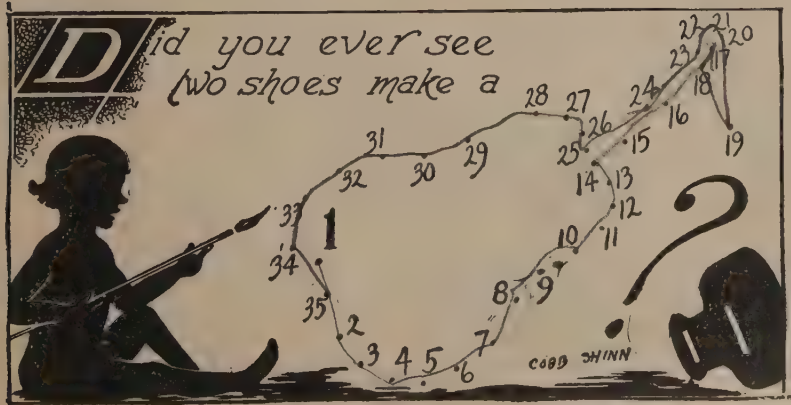
Can You Draw

This Entire Picture with a single line and not cross lines anywhere?

Which of these two Squares is the larger?



Measure them for you are more than likely wrong ◆ ◆ ◆ ◆
Because this is an illusion.



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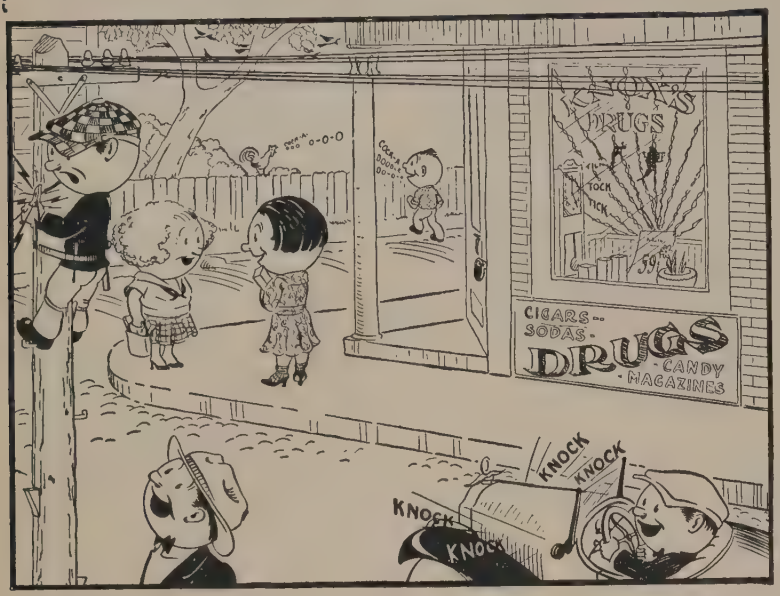
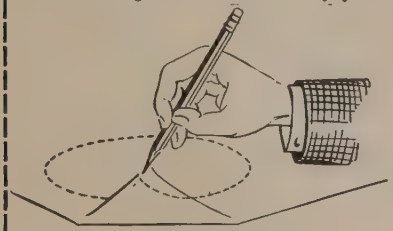
How many rhyming words does this picture suggest?



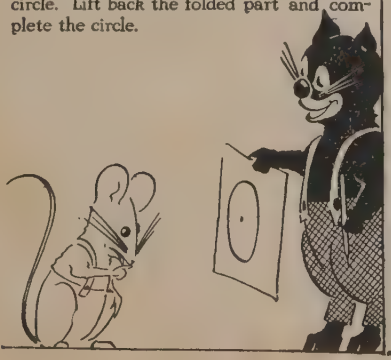
The Key Words
are
Clock and Cap

TRY THIS ONE

Draw a Circle with a dot in the center without taking the Pencil off of the paper.



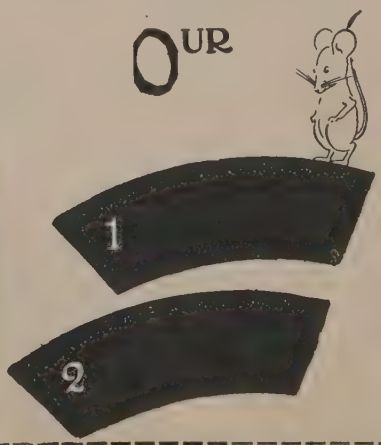
How to do it: First make the dot, then fold one corner of the paper over to the pencil, draw backward on the back side of the paper to the place where you want to start the circle. Lift back the folded part and complete the circle.



A NUMBER PYRAMID

```
1 x 9 + 1 = 10
12 x 9 + 2 = 110
123 x 9 + 3 = 1110
1234 x 9 + 4 = 11110
12345 x 9 + 5 = 111110
123456 x 9 + 6 = 1111110
1234567 x 9 + 7 = 11111110
12345678 x 9 + 8 = 111111110
123456789 x 9 + 9 = 1111111110
```

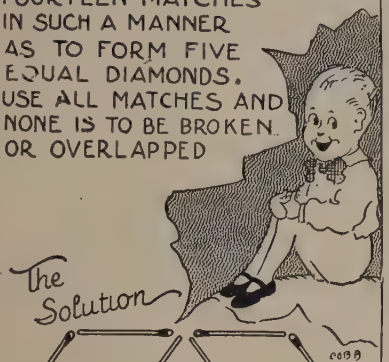
OUR DECEPTIVE EYES



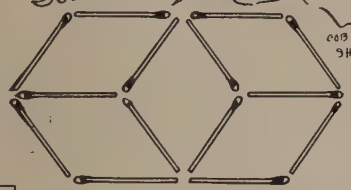
Which appears the Larger? Just for fun measure them and see if your eyes have deceived you.

A VERY NEAT LITTLE TRICK

ASK SOMEBODY TO ARRANGE FOURTEEN MATCHES IN SUCH A MANNER AS TO FORM FIVE EQUAL DIAMONDS. USE ALL MATCHES AND NONE IS TO BE BROKEN OR OVERLAPPED

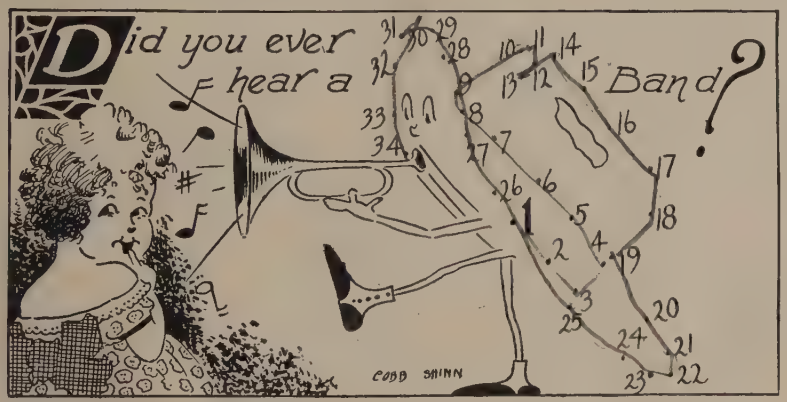


The Solution



WHO IS THE TALLEST?

Can you tell which is the tallest, without using a ruler or a compass? Make your guess, then measure and see if you have been fooled.



MAGIC DOTS

To find the answer put a piece of thin paper over the illustration and draw a continuous line from dot 1 to dot 2 to dot 3, etc.

WITH TWO STROKES OF YOUR PENCIL MAKE ONE THOUSAND ONE HUNDRED AND ELEVEN INTO NOTHING

1111

EASY!

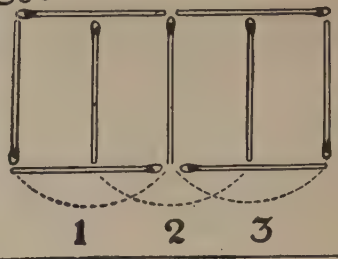
NIX

TRY THIS TRICK ON DAD

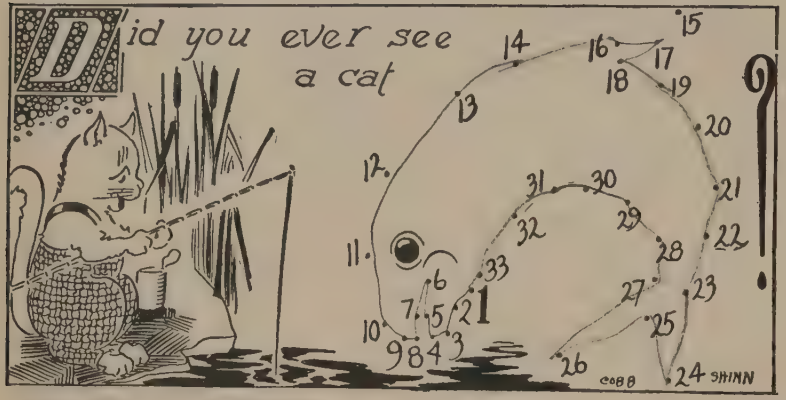
ASK YOUR FRIENDS TO TRY THIS ONE

USE ONLY NINE MATCHES TO MAKE THREE SQUARES

The Solution



Did you ever see a cat



MAGIC DOTS

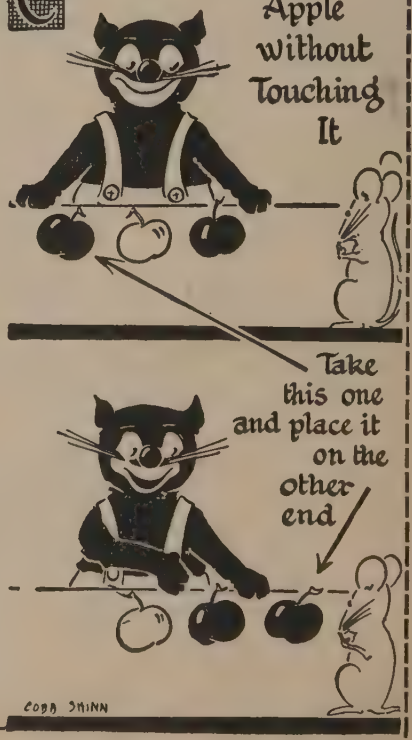
To find the answer put a piece of thin paper over the illustration and draw a continuous line from dot 1 to dot 2 to dot 3, etc.

It comes without warning,
And makes you cry, "Oh."
But you never can see it
Or tell where it goes.

A				
1	16	1	9	14

The numbers stand for the letters of the alphabet. A is one, B is two and so on.

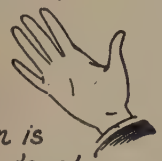
Take Away the Middle Apple without Touching It



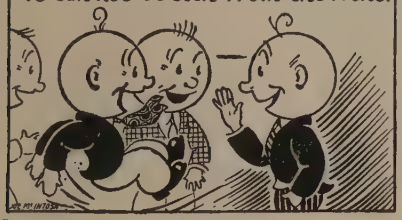
A Small Coin in the palm of the hand

Close the fist

CHANGE-O!
Open the fist
The Coin is gone!



THE SECRET
A Bit of gum on the finger nail will make the coin stick to the finger. It can not be seen from the front.



Feed it on sticks and old black stones
It grows and blushes red,
But, what do you think,
if you give it a drink,
You'll find it smoking in bed!

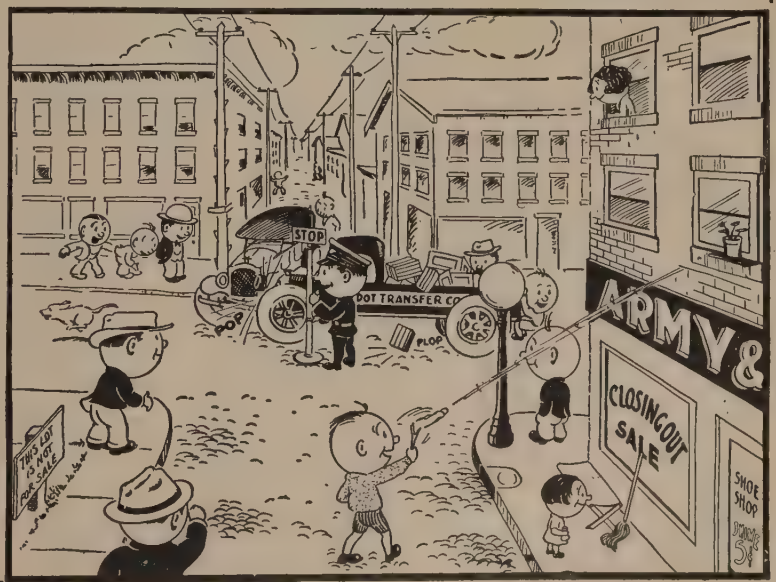
The Answer

A	F	I	R	E
1	6	9	18	5

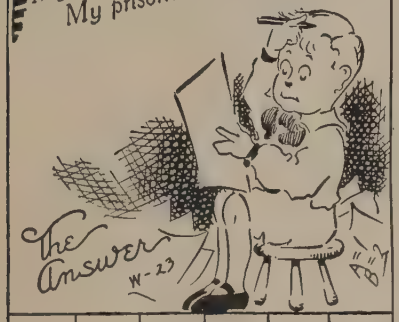
The numbers stand for the letters of the alphabet. A is one, B is two and so on.

How many rhyming words does this picture suggest?

The Key Words
are
Stop and Crash



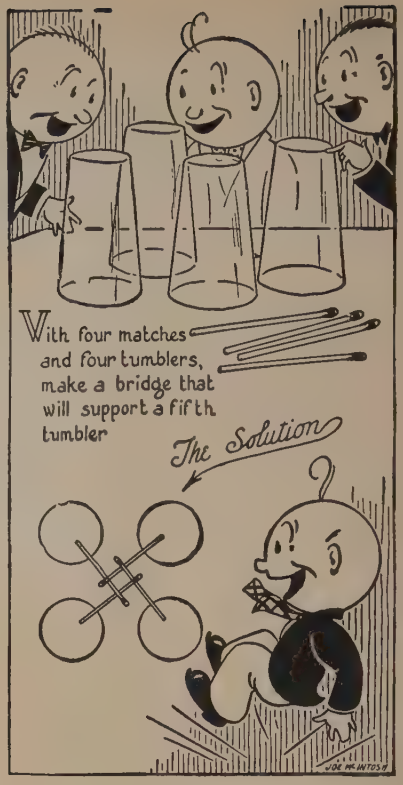
I help you eat, I help you sleep
My frame is square and thin.
My bars run crosswise, and I keep
My prisoners out, not in.



W	I	N	D	O	W
23	9	14	4	15	23

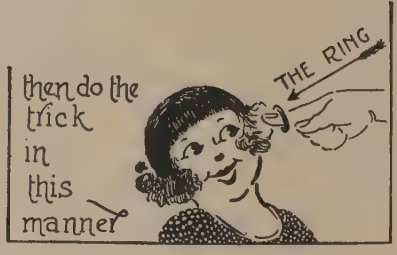
S	C	R	E	E	N
19	3	18	5	5	14

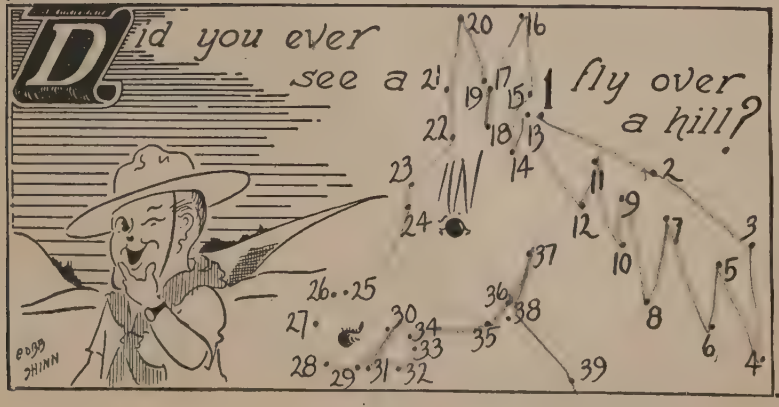
The numbers stand for the letters of the alphabet. A is one, B is two and so on.



YES// It Can Be Done

Say to anybody "I can push your head through a ring" When they declare that you cannot.





MAGIC DOTS

To find the answer put a piece of thin paper over the illustration and draw a continuous line from dot 1 to dot 2 to dot 3, etc.

If the answers are awkward to find,
Or the puzzles and problems are blind,
  Trust your worst proposition
  To this old mathematician,
For he carries them all in his mind.

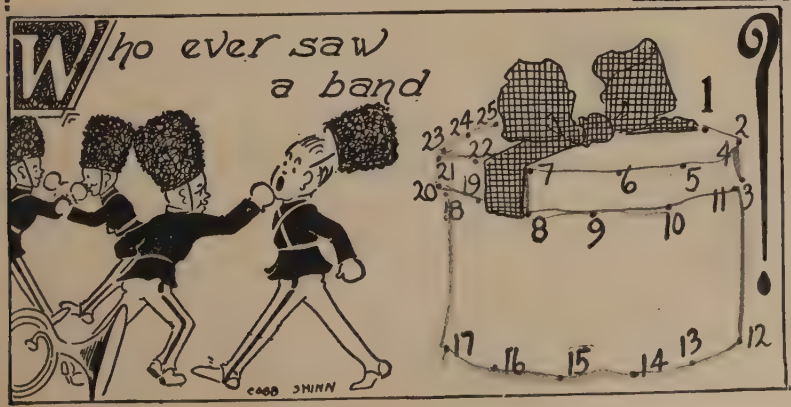
How many rhyming words does this picture suggest?

The Key Words
are
Cat and Drum

TO KEEP THEM GUESSING

ASK SOMEONE
TO ARRANGE
SEVEN
MATCHES

INTO A
CROSS
SO THAT
YOU CAN COUNT FIVE MATCHES
EITHER CROSSWISE
OR UP AND DOWN

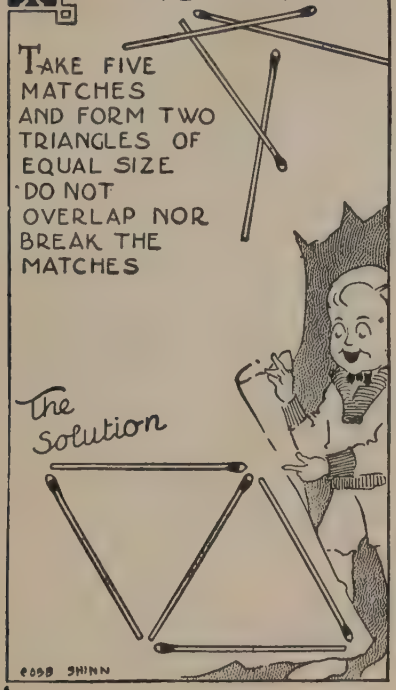


MAGIC DOTS

To find the answer put a piece of thin paper over the illustration and draw a continuous line from dot 1 to dot 2 to dot 3, etc.

THE TWIN TRIANGLES MYSTERY

TAKE FIVE MATCHES AND FORM TWO TRIANGLES OF EQUAL SIZE. DO NOT OVERLAP NOR BREAK THE MATCHES



The Solution

COBB SHINN

What is covered all over
with a jacket,
And carries his eyes
in his deep pockets?

The Answer

A

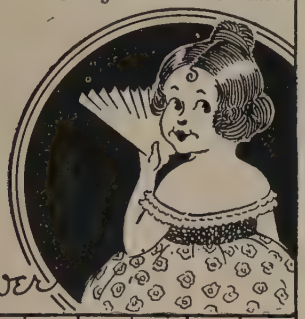
P	O	T	A	T	O
16	15	20	1	20	15

The numbers stand for the letters of the alphabet. A is one, B is two and so on.

How many rhyming words does this picture suggest?

The Key Words
are
Cry and Car

Dainty maids
in frills of white
With hearts as
golden as can be;
They watch the
starry skies at night,
But when it's day,
they dance for me!



The Answer

D	A	I	S	I	E	S
4	1	9	19	9	5	19

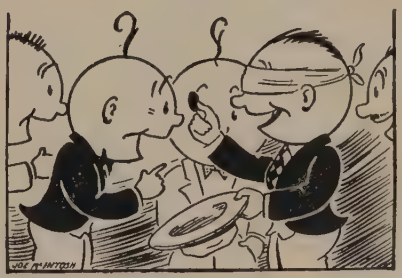
The numbers stand for the letters of the alphabet. A is one, B is two and so on.

When a dog runs a trail
all crooked and funny,
What does he find that
sounds like money?

The Answer

tnecS a sdnif eH

To read the answer, read from right to left, the answer is just backwards.

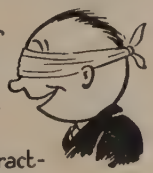


THE WARM COIN TRICK

Place nine or ten coins in a hat

Allow one of your audience to pick a coin from the hat, holding it two or three minutes then dropping it back into the hat. Shake the hat so that the coins are mixed up.

Have one of your audience to blindfold you.



The chosen coin is detected by the warmth it has contracted from the persons hand.

adaal

With three straight marks: what word will these ciphers change into?

adapt

Easy/when you know how.

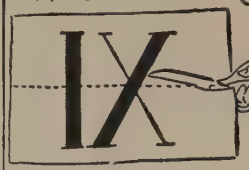
TRY THIS STUNT ON YOUR FRIENDS

ARRANGE FIFTEEN MATCHES IN THIS MANNER

NOW REMOVE SIX MATCHES AND STILL LEAVE TEN

The Solution

Divide 9 into two parts which together shall be equal to 10.



Cut on the dotted line.

Easy when you know how.

"Four More"

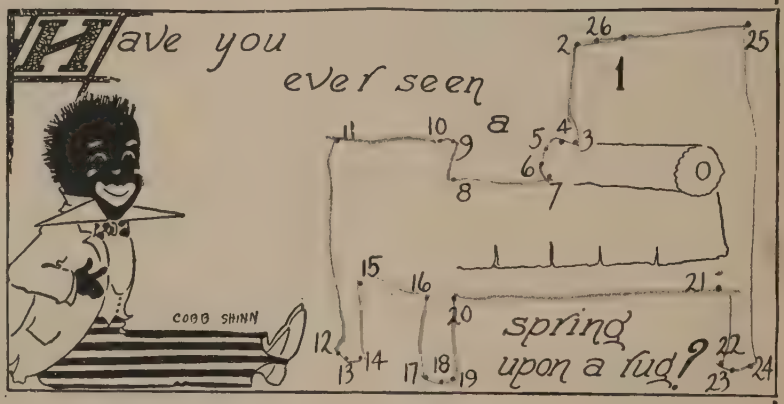
Is this Correct?

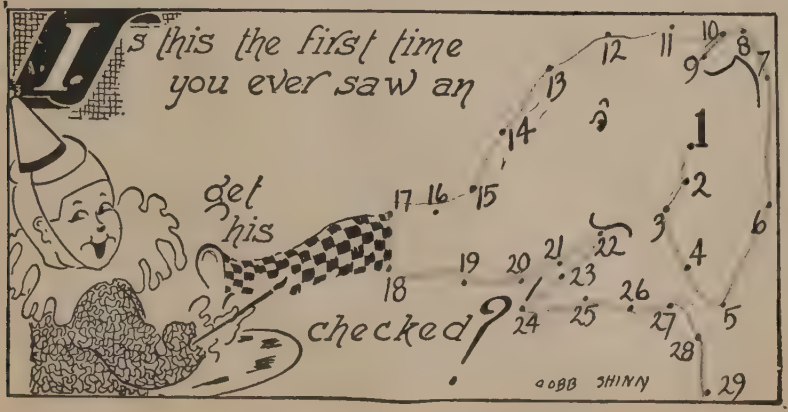
Four Matches Make A

How many more matches are needed to make another square? Nearly every one will say

MAGIC DOTS

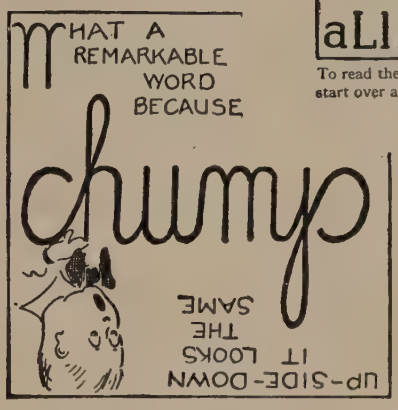
To find the answer put a piece of thin paper over the illustration and draw a continuous line from dot 1 to dot 2 to dot 3, etc.





To read the answer, start at the bottom and read up follow the arrows.

To read the answer, read the capital letters first, then start over again and read the small letters.



It sings in the treetops
It howls in the storm;
It plays with the children,
Sometimes cold,
Sometimes warm

The Answer

T	H	E
20	8	5

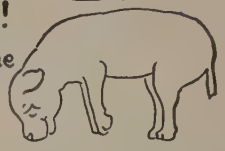
W	I	N	D
23	9	14	4

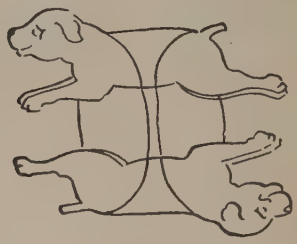
The numbers stand for the letters of the alphabet. A is one, B is two and so on.

BRING THE DOGS TO LIFE.

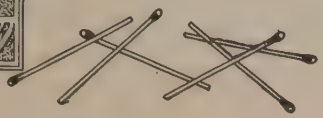
EASY!

Turn the paper part way around and add four lines





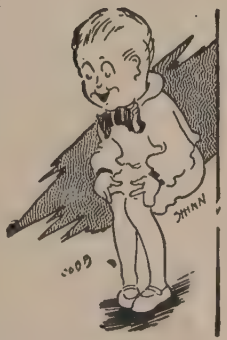
VERY PUZZLING



TRY TO MAKE FOUR TRIANGLES AND USE ONLY SIX MATCHES

The Solution

LAY THREE MATCHES ON THE TABLE TO FORM A TRIANGLE, THEN STAND THE OTHER THREE UPRIGHT IN THIS MANNER



The Answer

To read the answer, hold this picture up to a mirror

Answer this, Answer this,
Now listen to me.
Who keeps warm without clothes
In a cold country?

The Answer

AN ALAinSKANhis
IND bear IANskin.

To read the answer, read the capital letters first, then start over again and read the small letters.

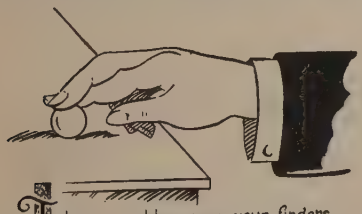
Little red headed Bobby
Was struck on the head.
Now his head is black,
Before it was red.

The Answer

dedaeH deR elttiL
hctaM a si ybboB

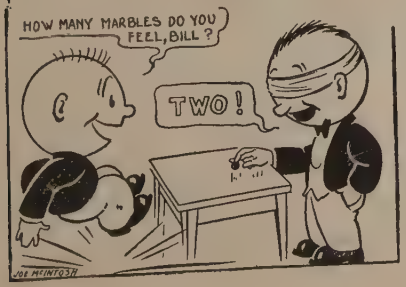
To read the answer, read from right to left, the answer is just backwards.

A Clever Illusion

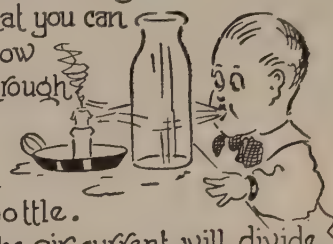


Take a marble, cross your fingers as shown, and roll the marble about under your fingers.

With eyes closed or blindfolded you will distinctly feel two marbles instead of one.



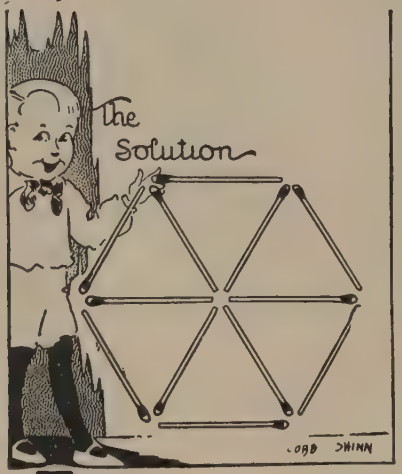
Convince your friends that you can blow through a bottle.



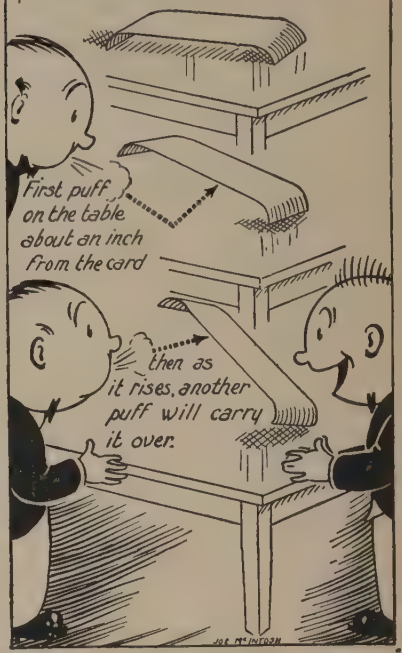
The air current will divide, flow around the bottle, reunite and extinguish the flame.

EVER TRY THIS?

ARRANGE TWELVE MATCHES SO THAT THEY FORM SIX EQUAL TRIANGLES NO MATCHES ARE TO BE BROKEN NOR ARE THEY TO OVERLAP



Bend a calling card as shown and challenge your friends to blow it over. It is impossible unless you blow as shown:



Little white men
in a curved line
Don't need a hair cut,
but want a frequent shine.

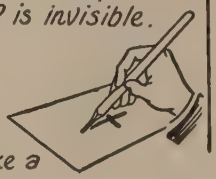
The Answer

These | little | white | men | are | your | teeth

To read the answer, start at the bottom and read up, follow the arrows

A Curious Cross

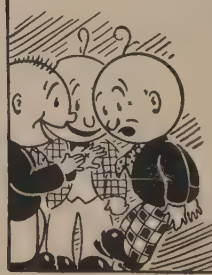
In secrecy make a cross on the back of your hand with soap which is invisible.

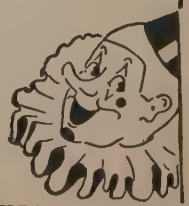


Before your audience make a cross on paper, the same size

Burn the paper

Tell your audience that the cross on the paper will appear on your hand by rubbing the ashes on it.

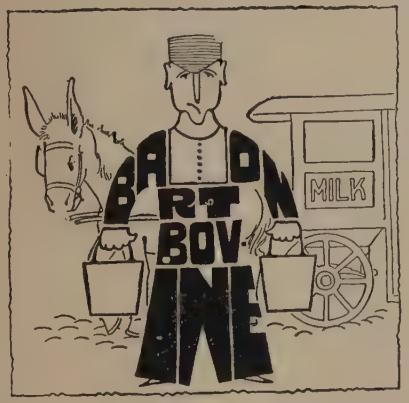




SPELLINGTOWN

This is the mayor of Spellingtown
Who wears his silk hat upside down
He has to be both tall and wide
To get his entire name outside.

A church that is the city's pride
Must spell in manner dignified.
So with deportment that compels,
Its name this Main St. Chapel spells.



And now the milk-man comes along
And says, "I'll show where I belong!
Not only do I spell with ease,
But dot my I's and cross my T's."

The milk-man's cow sometimes observes
"These spellers get upon my nerves!"
But none the less her sides are spread
With words that reach from tail to head!

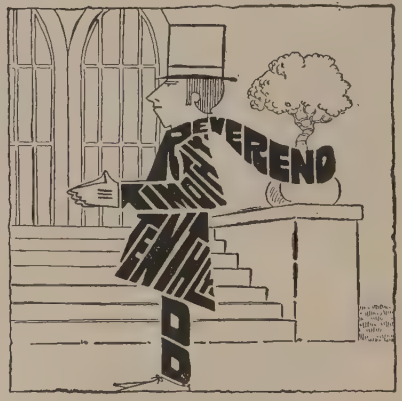
The dwellers in this boarding place
Are proud that it has kept apace
With school, church, bank, and all the rest
And spells its story with the best.

School teachers should know how to spell
But this one does it extra well.
Observe her name and you will see,
How very good she has to be. . . .

In Spellingtown a pump or two
Take pride in being spellers too.
This one you see is very smart,
In fact its spelling is an art.

The village goat is not outdone
When spelling honors may be won.
His title takes a graceful trend
From horns unto his nether end.

The news-boy says "Pray do not think
Because I do not preen and prink,
That I'm not educated too,
Observe my name spelled out for you."



The Reverend Tenthly feels that he
The speaker for his flock should be,
And so he says, "We're proud to be
Versed in current orthography."

BIBLE CURIOSITIES AND MEMORY-TESTS

SCRIPTURE ALPHABET GAMES

I

First player writes a couplet beginning with A, the second player one beginning with B, etc. The result might be:

A is for Adam, the first man God made,
Who dwelt in the Garden of Eden's fair shade.

B is for Bethlehem; Jesus was born
In Bethlehem town the first Christmas morn.

C for the Children who stood at Christ's knee,
As he tenderly bade them "Come unto me."

D for the Dove bringing tidings of peace,
By which Noah knew the waters would cease.

E for Elijah, whom ravens once fed,
Bringing him daily from heaven his bread.

F for the Flight of the holy Christ-child
With Joseph, and Mary, his mother so mild.

G for the Goodness, and Gentleness too,
The Samaritan showed the poor wounded Jew.

H is for Hannah: the son she loved well
She brought to the Temple with Eli to dwell.

I is for Isaac, who, God said, should die;
Meaning that Abraham's faith he would try.

J is for Jesus, so tender and true,
Who promised to love little children like you.

K for the Kingdom of heaven on high,
Where Jesus now dwells far beyond the blue sky.

L for the Laws that were graven so plain;

M is for Moses who broke them in twain;
Fierce in his wrath, for the people he led
No longer served God, but an idol instead.

N is for Nazareth, where, calm and content,
The beautiful years of Christ's childhood were spent.

O for Obedience which children should show
To their Father on high and their parents below.

P for the Prophets stands, by whom of old
God's will to His people was ever foretold.

Q for the Quails, which the Israelites found,
When, hungry, they searched for some food all around.

R is for Ruth, who one fair harvest morn
Gleaned 'mong the sheaves of the bright golden corn.

S is for Samuel, who, though very small,
Was yet not afraid to answer God's call.

T for the Temple, in which Jesus taught
And turned out the merchants who there sold and bought.

U for Uriah, so trusty and tried,
Who fought for his country and valiantly died.

V for the Vision, the heavenly gleam,
Jacob once saw in his beautiful dream.

W for the Widow who gave God her mite;
The offering, though small, was great in His sight.

X is for Xmas, that happy day when
Jesus brought peace and good will unto men.

Y for the Years since our dear Saviour's birth,
Bringing rich blessings to men upon earth.

Z for the Zeal we should all of us show
Praising our God in His kingdom below.

II

One person writes a line beginning with "A," which must be the initial of somebody or something mentioned with some prominence in the Bible. The second player must write the next line in the same meter, beginning with "B"; the third "C," and so on, until the end of the alphabet is reached—passing the paper from one to another. Any one who confesses inability may refuse, and the next player writes the line, until finally one person may be left alone as victor. If two or more contestants still dispute the victory when "Z" is reached, they may begin again with "A."

Scripture Alphabet

A was a traitor found hung by his hair.
B was a folly built high in the air.
C was a mountain o'erlooking the sea.
D was a nurse buried under a tree.
E was a firstborn, bad from his youth.
F was a ruler, who trembled at truth.
G was a messenger, sent with good word.
H was a mother, who lent to the Lord.
I was a name received at the ford.
J was a shepherd in Arabian land.
K was a place near the desert of sand.
L was a pauper begging his bread.
M was an idol, an object of dread.
N was an architect, ages ago.
O was a rampart to keep out the foe.
P was an isle, whence a saint looked above.
Q was a Christian, saluted in love.
R was obscure, yet a mother of kings.
S was a Danite, who did wondrous things.
T was a city that had a strong hold.
U was a country productive of gold.
V was a queen whom a king set aside.
Z was a place where a man wished to hide.

Answers to Scripture Alphabet

A-bsalom	II. Sam. xviii. 9.
B-abel	Gen. xi. 9.
C-armel	I. Kings xviii. 42, 43.
D-eborah	Gen. xxxv. 8.
E-sau	Heb. xii. 16.
F-elix	Acts xxiv. 25.
G-abriel	Dan. ix. 21.
H-annah	I. Sam. i. 27, 28.
I-srael	Gen. xxxii. 22, 28.
J-ethro	Ex. iii. 1.
K-adesh-barnea	Deut. i. 19.
L-azarus	Luke xvi. 20, 21.
M-olech	Lev. xx. 2, 3.
N-oah	Gen. vi. 13, 22.
O-phel	II. Chron. xxvii. 3.
P-atmos	Rev. i. 9.
Q-uartus	Rom. xvi. 23.
R-achab	Matt. i. 5.
S-amson	Judg. xiv. 5, 6.
T-yre	II. Sam. xxiv. 7.
U-phaz	Jer. x. 9.
V-ashti	Esther i. 9, 19.
Z-oar	Gen. xix. 22.

BIBLE CHARACTERS

I

A CHARACTER is chosen by the company in the absence of one player, who, upon his return, is told, for example, that the person selected is "a woman of the Old Testament, whose eagerness to secure a blessing for her son brought sorrow instead of joy."

Each person is then questioned in turn, and each has chosen a new character, the initial letters of which in succession will spell the word originally decided upon.

No. 1 answers, "I am one whose rejection of faithful counselors led to a national rebellion."

No. 2. "To me was the charge of the tabernacle committed during the wilderness journey."

No. 3. "I was so wrong-headed that even my dumb beast tried to lead me aright."

No. 4. "I am a prophet who was a witness for God before multitudes, and yet fled for my life at the threat of a woman."

No. 5. "I am the father of a man who made a failure of his life, though in appearance 'every inch a king.' "

No. 6. "I represent the place of Israel's first defeat after entering Canaan."

No. 7. "I had a fine navy, which brought great riches to Jerusalem."

Answers

Rebekah:

1. Rehoboam.
2. Eleazar.
3. Balaam.
4. Elijah.
5. Kish, father of Saul.
6. Ai.
7. Hiram of Tyre.

II

To be written and the answers appended:

1. Who like the lion seeketh to devour,
   The godly man in an unguarded hour?
2. Whose occupation did the apostle share
   When forced to labor for his daily fare?
3. In what did Ruth her present take away,
   Which to her mother she did straight convey?
4. To what great sin was Israel's nation prone,
   Which robbed their God of what was his alone?
5. Who was by faith enabled to despise
   The lion's yawning jaws and glaring eyes?

Take now the five initials, and you'll find
The name of one most favored of mankind.
He, choosing in his youth the better part,
Was called by God one after his own heart.

Answers

1. Devil.
2. Aquila.

3. Veil.
4. Idolatry.
5. Daniel.

The initial letters of which spell David.

CAPPING QUOTATIONS

One person gives a quotation from the Bible, which must be promptly followed by another from the next player *beginning with* the letter that concluded the former quotation. For example:

"Shall not the Judge of all the earth do right?"

"The way of transgressors is hard."

"Delight thyself in the Lord, and he shall give thee thy heart's desire."

"Endure all things."

"Search the Scriptures."

"Solomon in all his glory was not arrayed like one of these."

"Every good gift and every perfect gift is from above."

"Even a fool when he holdeth his peace is counted wise."

"Evil communications corrupt good manners."

"Seek, and ye shall find."

"Do good and lend, hoping for nothing again."

"Not every one that saith unto me Lord, Lord, but he that doeth the will of my Father."

"Rejoice in the Lord always," etc.

THE "FIRST THINGS" OF THE BIBLE

1. What was the first command of God?
2. On what occasion did man first exercise his power of speech?
3. Who was the first human transgressor?
4. What was the first recorded prophecy?
5. Who was the first exile in Bible times?
6. Who told the first recorded lie?
7. Where do we find the oldest Hebrew poetry?
8. Who was the first person that died a natural death?
9. Who offered the first recorded prayer?
10. What was the first mentioned meat for food?
11. By whom was the first land purchased?
12. What is the first recorded use of current money?
13. How was the first recorded oath administered?
14. Of what did the first wedding present consist?
15. Where is the first mention of giving a tenth to God?
16. Who erected the first monument to the dead?
17. With what operation are physicians first mentioned?
18. Who was the first Jewish high priest?
19. Who was the first sacred historian?
20. Which of the tribes marched first in the wilderness journey?
21. Who was the first to commit suicide, and how?
22. Where is the first mention of a library?
23. What was the text of our Saviour's first sermon?
24. Who was the first recorded Gentile convert?

Answers to the "First Things" of the Bible

1. "Let there be light."—Gen. i. 3.
2. On giving names to the animal creation.—Gen. ii. 19.
3. The woman Eve.—I. Tim. ii. 14; Gen. iii. 1.
4. The coming of Christ.—Gen. iii. 15.
5. Adam.—Gen. iii. 24.
6. Cain.—Gen. iv. 9.
7. Lamech's address to his wives is probably the oldest Hebrew poetry to be found.—Gen. iv. 23, 24.
8. Adam.—Gen. v. 5.
9. Abraham.—Gen. xviii. 16–33.
10. Veal.—Gen. xviii. 7, 8.
11. Abraham.—Gen. xxiii. 3, 4, 16, 18.
12. By Abraham in the purchase of land.—Gen. xxiii. 16.
13. By putting the hand of the person sworn under the thigh of the person administering.—Gen. xxiv. 2, 3.
14. Earrings, bracelets, jewels, etc.—Gen. xxiv. 22, 30, 53.
15. Jacob at Bethel.—Gen. xxviii. 22.
16. Jacob, at the grave of Rachel.—Gen. xxxv. 20.
17. The embalming of Jacob's body.—Gen. l. 2.
18. Aaron.—Ex. xxviii. 1.
19. Moses.—Num. i. 17, 18.
20. The tribe of Judah.—Num. x. 14.
21. Saul, by falling on his sword.—I. Sam. xxxi. 4.
22. The house of the rolls, or books, the king's library.—Ezra vi. 1.
23. Repent.—Matt. iv. 17.
24. Cornelius.—Acts x. 3.

OLD TESTAMENT QUERIES

1. Who built Nineveh?
2. Who suggested selling Joseph to the Ishmaelites?

3. What was the name of Joseph's wife in Egypt?

4. From whom did Moses receive his name?

5. Who built a monument in the middle of a river, and why?

6. What criminal in his confession said, "I saw, I coveted, I took"?

7. Who said, "As for me and my house, we will serve the Lord"?

8. Who said, "Ye are witnesses against yourselves"?

9. Who told his life's secret to a woman with disastrous results?

10. What is the most noted instance of devoted friendship?

11. Six women once took a journey which resulted in a wedding. Who were the bride and groom?

12. From what king did David take both crown and capital?

13. Whose head was cut off and thrown over a wall at the suggestion of a woman?

14. Who does the Bible say had six fingers on each hand and six toes on each foot?

15. Who preferred in the time of trouble to fall into God's hands, rather than into the hands of man?

16. Whose daughter was Solomon's first wife?

17. Who built Tadmor (Palmyra) in the desert?

18. What two Old Testament persons fasted forty days?

19. What queen sent a message with a forged signature?

20. Who destroyed the brazen serpent Moses made?

21. What laboring men were so honest that no accounts were kept?

22. By whom was Solomon's temple destroyed?

23. To which son of Jacob was the birthright given when taken from Reuben?

24. Whose faces were like the faces of lions?

25. What tribe furnished the counselors of Israel?

26. What tribe of Israel was specially characterized by sincerity?

27. Who were the doorkeepers of the ark?

28. To whom was applied the military title of general?

29. What king had eighty-eight children?

30. Who was in command of one million of soldiers?

31. What queen in Bible times is described as that "wicked woman"?

32. Who, of the kings of Israel, was carried captive to Babylon, and brought back to Jerusalem?

33. What king of Judah had not seen a copy of the law till he was twenty-six years old?

34. What women helped to rebuild the walls of Jerusalem?

35. Who said, "The Lord gave, and the Lord hath taken away"?

36. Who said, "All that a man hath will he give for his life"?

37. Who expressed a desire to be where the wicked cease from troubling and the weary are at rest?

38. Who said, "Though he slay me, yet will I trust him"?

39. Who says "in his heart, There is no God"?

40. Who acknowledges that the lines are fallen unto him in pleasant places?

41. Who said, "All men are liars"?

42. Who said, "He who ruleth his spirit is better than he who taketh a city"?

43. Who said, "A man that hath friends must show himself friendly"?

44. Who does the Bible say "cannot prosper"?

45. Who prayed, "Give me neither poverty nor riches"?

46. Who said, "There is no discharge in that war"?

47. To whom was it revealed several hundred years before that the Redeemer should be born of a virgin?

48. Who said, "The host of heaven shall be dissolved"?

49. Who lamented "the harvest is past, and the summer is ended"?

50. Who asked, "Can the Ethiopian change his skin"?

51. What other nation besides Israel is to be scattered to all people?

52. Who was Belshazzar's successor as king of the Chaldeans?

53. Who said, "Ephraim is joined to his idols, let him alone"?

54. What prophet was a herdsman?

55. What prophet was sent as a missionary to the Gentiles?

56. What prophet said, "In wrath, remember mercy"?

57. What prophet said, "They save wages to put into a bag with holes"?

58. Who said, "At evening time it shall be light"?

59. Who asked the question, "Will a man rob God?"

60. What became of the golden calf set up by Aaron in the wilderness journey?

61. For how long did marriage exempt a man from going to war?

Answers to Old Testament Queries

1. Asshur.—Gen. x. 11.
2. Judah.—Gen. xxxvii. 26, 27.
3. Asenath.—Gen. xli. 45.
4. Pharaoh's daughter.—Ex. ii. 10.
5. Joshua, in Jordan, as a memorial of God's deliverance.—Josh. iv. 9.
6. Achan.—Josh. vii. 21.
7. Joshua.—Josh. xxiv. 15.
8. Joshua.—Josh. xxiv. 22.
9. Samson.—Judg. xvi. 17.
10. That of Jonathan and David.—I. Sam. xviii. 1.
11. Abigail and David.—I. Sam. xxv. 42.
12. From the king of the Ammonites.—II. Sam. xii. 29, 30.
13. The head of Sheba.—II. Sam. xx. 21.
14. Goliath.—II. Sam. xxi. 20.
15. David.—II. Sam. xxiv. 14.
16. The daughter of Pharaoh, King of Egypt.—I. Kings iii. 1.
17. Solomon.—I. Kings ix. 17, 18.
18. Moses and Elijah.—Ex. xxiv. 18; I. Kings xix. 8, 9.
19. Jezebel used Ahab's name.—I. Kings xxi. 8.
20. Hezekiah.—II. Kings xviii. 4.
21. Workmen on the temple.—II. Kings xxii. 7.
22. Nebuchadnezzar.—II. Kings xxv. 1–11.
23. To Joseph.—I. Chron. v. 1.
24. The Gadites.—I. Chron. xii. 8.
25. Issachar.—I. Chron. xii. 32.
26. Zebulon.—I. Chron. xii. 33.
27. Obed-Edom and Jehiah.—I. Chron. xv. 24.
28. Joab, of David's army.—I. Chron. xxvii. 34.
29. Rehoboam.—II. Chron. xi. 21.
30. Zerah.—II. Chron. xiv. 9.
31. Athaliah.—II. Chron. xxiv. 7.
32. Manasseh.—II. Chron. xxxiii. 11, 13.
33. Josiah.—II. Chron. xxxiv. 1, 18.
34. The daughters of Shallum.—Neh. iii. 12.
35. Job.—Job i. 21.
36. Satan.—Job ii. 4.
37. Job.—Job iii. 17.
38. Job.—Job xiii. 15.
39. The fool.—Psalms xiv. 1.
40. David.—Psalms xvi. 6.
41. David.—Psalms cxvi. 11.
42. Solomon.—Prov. xvi. 32.
43. Solomon.—Prov. xviii. 24.
44. He that covereth his sins.—Prov. xxviii. 13.
45. Agur.—Prov. xxx. 8.
46. Solomon.—Eccl. viii. 8.
47. Ahaz.—Isaiah vii. 14.
48. Isaiah, God's command.—Isaiah xxxiv. 4.
49. The Jews.—Jer. viii. 20.
50. Jeremiah.—Jer. xiii. 23.
51. Elamites.—Jer. xlix. 36.
52. Darius.—Dan. v. 31.
53. The prophet Hosea.—Hosea iv. 17.
54. Amos.—Amos i. 1.
55. Jonah.—Jonah i. 2.
56. Habakkuk.—Hab. iii. 2.
57. Haggai.—Hag. i. 6.
58. Zechariah.—Zech. xiv. 7.
59. Malachi.—Mal. iii. 8.
60. It was ground to powder, mixed with water, and the Israelites forced to drink it.—Ex. xxxii. 20.
61. For a year. "He shall be free at home for one year, and he shall cheer his wife which he hath taken."—Deut. xxiv. 5.

NEW TESTAMENT QUERIES

1. Who was reigning in Judah when Joseph returned from Egypt with the child Jesus?
2. Who were the first called of the disciples?
3. Whose birthday was celebrated by dancing?
4. With whom did Jesus spend his last Sabbath?
5. Who was the only person, according to the New Testament, who raised a voice in behalf of Jesus during the trial?
6. Who rose from the dead without the interposition of the prophets, Jesus, or the apostles?
7. What leader was seen 1500 years after his death?
8. Of whom was it said, "She hath done what she could"?
9. What are the first recorded words of Jesus?
10. Who paid the hotel bill of a man who had been robbed?
11. To what king did Christ refer when he said, "Go ye and tell that fox"?
12. Who asked Jesus, "Art thou only a stranger in Jerusalem?"
13. Who testified of Jesus that he was both his successor and predecessor?
14. By whom are we told to "search the Scriptures"?
15. What is the test of discipleship?
16. Whose curiosity was checked by Christ, and how?
17. Who is pronounced a doctor of the law?
18. Who was reading the writings of a prophet while riding in a chariot?
19. What were Paul's first words after conversion?
20. Who was the first apostle to raise a dead person to life?
21. Which of the disciples was a tanner?
22. Who, in speaking of Christ, said, "He went about doing good"?

23. Who was the first Christian convert in Europe?

24. What Athenian judge was converted under Paul's preaching?

25. What emperor banished all Jews from Rome?

26. Of whom was it said, "He was mighty in the Scriptures"?

27. What prisoner in chains stood on the steps of a castle and addressed a multitude?

28. Who was St. Paul's teacher?

29. What unrighteous judge trembled before a prisoner in chains?

30. Who was captain of the guard that took Paul to Rome?

31. Who was the chief man on the island of Melita, where Paul was shipwrecked?

32. How long did Paul preach at Rome?

33. What apostle expressed a desire to travel in Spain?

34. What Christian was recommended to the apostles for hospitality?

35. What woman carried St. Paul's epistle to the Romans?

36. Who said, "At the name of Jesus every knee shall bow"?

37. Who said, "Hold fast to that which is good"?

38. What example have we of early piety in the New Testament?

39. Name three heathen writers whom St. Paul quotes.

40. Who said, "To the pure all things are pure"?

41. Who said, "Every good gift and every perfect gift is from above"?

42. Who said, "The devils also believe that there is one God"?

43. Name three persons whose afflictions were a source of enjoyment.

44. What member of the primitive Church tried the patience of the loving disciple John?

45. God will wipe away all tears from the eyes of whom?

46. Give the name of two angels mentioned in the Bible.

47. Who was the first Christian martyr?

48. From what place in Palestine did the Ascension take place?

Answers to New Testament Queries

1. Archelaus.—Matt. ii. 22.
2. John and Andrew.—John i. 37–41.
3. Herod's.—Matt. xiv. 6.
4. Simon, the Leper.—Matt. xxvi. 6.
5. The wife of Pontius Pilate.—Matt. xxvii. 19.
6. "The Saints that slept arose."—Matt. xxvii. 52.
7. Moses, by Peter, James, and John.—Mark ix. 2 and 5.
8. The woman who poured the ointment on the Saviour's head.—Mark xiv. 3, 8.
9. "How is it that ye sought me?"—Luke ii. 49.
10. The good Samaritan.—Luke x. 35.
11. King Herod.—Luke xiii. 31, 32.
12. Cleopas.—Luke xxiv. 18.
13. John the Baptist.—John i. 15.
14. Our Saviour.—John v. 39.
15. "If ye have love one to another."—John xiii. 35.
16. Peter's.—John xxi. 21, 22.
17. Gamaliel.—Acts v. 34.
18. The eunuch.—Acts viii. 30.
19. "Lord, what wilt thou have me to do?"—Acts ix. 6.
20. Peter.—Acts ix. 40.
21. Simon.—Acts x. 6.
22. Simon Peter.—Acts x. 38.
23. Lydia, of Thyatira.—Acts xvi. 14.
24. Dionysius.—Acts xvii. 34.
25. Claudius.—Acts xviii. 2.
26. Apollos.—Acts xviii. 24.
27. Paul.—Acts xxi. 40.
28. Gamaliel.—Acts xxii. 3.
29. Felix.—Acts xxiv. 25.
30. Julius.—Acts xxvii. 1.
31. Publius.—Acts xxviii. 7.
32. Two years.—Acts xxviii. 30.
33. St. Paul.—Rom. xv. 24, 28.
34. Gaius.—Rom. xvi. 23.
35. Phebe.—Rom. xvi. 1.
36. Paul, to the Philippians.—Phil. ii. 10.
37. Paul.—I. Thess. v. 21.
38. Timothy.—II. Tim. iii. 15.
39. Aratus.—Acts xvii. 28. Menander.—I. Cor. xv. 33. Epimenides.—Titus i. 12.
40. Paul.—Titus i. 15.
41. James.—James i. 17.
42. James.—James ii. 19.
43. Paul.—Rom. v. 3; II. Cor. xii. 9, 10. James.—James i. 2. Peter.—I. Peter ii. 25.
44. Diotrephes.—III. John 9.
45. Those who have washed their robes and made them white.—Rev. vii. 13, 17.
46. Gabriel.—Dan. ix. 21; Luke i. 19. Michael.—Jude i. 9; Rev. xii. 7.
47. Stephen.—Acts vii. 54, 60.
48. Bethany.—Luke xxiv. 50, 51.

CURIOUS FACTS ABOUT THE BIBLE

The following interesting statements, said to be the fruits of three years' labor by Dr. Thomas Hartwell

Horne, and given by him in his "Introduction to the Study of the Scriptures," are based upon an old English Bible of the King James version.

Old Testament.—Number of books, 39; chapters, 929; verses, 23,214; words, 593,493; letters, 2,728,100.

New Testament.—Number of books, 27; chapters, 260; verses, 7,959; words, 181,253; letters, 838,380.

The Bible.—Total number of books, 66; chapters, 1,189; verses, 31,173; words, 773,746; letters, 3,566,480.

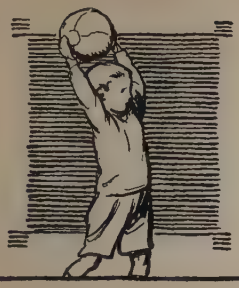
Apocrypha.—Number of books, 14; chapters, 184; verses, 6,031; words, 125,185.

Old Testament.—The middle book of the Old Testament is Proverbs. The middle chapter is Job xxix. The middle verse is II. Chronicles xx., between verses 17 and 18. The shortest book is Obadiah. The shortest verse is I. Chronicles i. 25. The word "and" occurs 35,543 times. Ezra vii. 21 contains all the letters of our alphabet. The word "Selah" occurs 73 times and only in the poetical books. II. Kings xix. and Isaiah xxxvii. are alike. The Book of Esther does not contain the words God or Lord. The last two verses of II. Chronicles and the opening verses of the Book of Ezra are alike. Ezra ii. and Nehemiah vii. are alike. There are nearly 30 books mentioned, but not found in the Bible, consisting of civil records and other ancient writings now nearly all lost. About 26 of these are alluded to in the Old Testament.

New Testament.—The middle book is II. Thessalonians. The middle chapter is between Romans xiii. and xiv. The middle verse is Acts xvii. 17. The smallest book is II. John. The smallest verse is John xi. 35. The word "and" occurs 10,684 times. The name Jesus occurs nearly 700 times in the Gospels and Acts, and in the Epistles less than 70 times. The name Christ alone occurs about 60 times in the Gospels and Acts, and about 240 times in the Epistles and Revelation. The term Jesus Christ occurs 5 times in the Gospels.

The Bible.—The middle book is Micah. The middle (and smallest) chapter is Psalm cxvii. The middle verse is Psalm cxviii. 8. The middle line is II. Chronicles iv. 16; the largest book is that of the Psalms; the largest chapter is Psalm cxix. The word Jehovah (or Lord) occurs 6,855 times. The word "and" occurs 46,227 times. The number of authors of the Bible is 50. The Bible was not until modern times divided into chapters and verses. The division of chapters has been attributed to Lanfranc, Archbishop of Canterbury, in the reign of William I.; but the real author of this division was Cardinal Hugo de Sancto-Caro, about 1236. The number of languages on earth is estimated at 3,000; the Bible or parts of it have been rendered into only about 180, or, languages and dialects together, 345.

OUR HOME GYMNASIUM



GYMNASTICS *for* LITTLE FOLKS

OUR HOME GYMNASIUM

BY MRS. ELIZABETH HUBBARD BONSALL

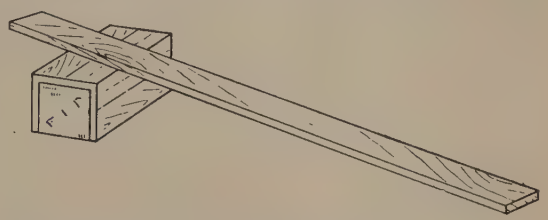
NOTHING will develop children's muscles so well, bring color to their cheeks, and give them so much real fun, as an out-of-door gymnasium. Perhaps the word "gymnasium" may arouse in a timid mother visions of accidents and over-straining, but with simple apparatus on the grass, placed not more than a foot or two above the ground, there is no more danger for children than in ordinary playing. In fact, there is less, for with it they are learning to control their muscles.

STARTING WITH ONE BOARD

We started our gymnasium last year with a smooth board and a couple of wooden boxes. I brought the board from the cellar with the idea of having it for sliding, and of all its uses I think that one is the most popular. Our board is an ideal size, eight feet long and one foot wide, but a shorter and narrower one will do. Even the leaf of an old table will serve very well, provided it is smooth and there are no splinters or rough edges. Also, one end of it can be placed upon the side edge of the steps, if it is not convenient to use a box.

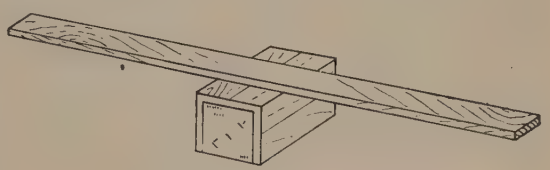
The children are constantly inventing new ways of coasting down. First they just sat down and slid, then they went down sidewise, then on their stomachs, and finally standing up, with the board at a low angle. Of course you can't expect them to wear lace-trimmed or hand-embroidered underclothes while doing this, but it is surprising how long a pair of bloomers or overalls will keep respectable.

Then we use our board as a seesaw, by putting it across a narrow box. As Betty is nearly five and Ann not quite two, I must carefully balance it for them to start with, but after that they go up and down by themselves to their hearts' content. I have them put their feet out straight on the board in front of them, so that

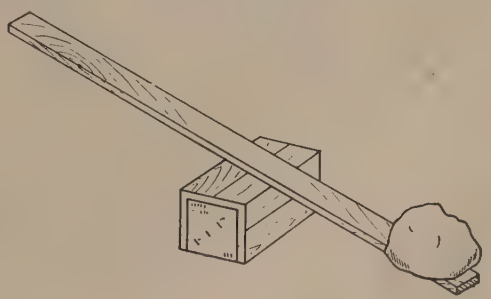


it seems as if they are going higher, as they go all the way down to the ground.

Betty herself discovered that, by having the



box in the middle, she could stand on the center of the board, tipping it up and down, and keeping her own balance perfectly.



We use the board as a springboard by having one end projecting about a foot over the edge of a low box. I am always careful to put my foot

on the lower end of the board as Betty is about to jump, otherwise it might suddenly fly up. And then we make a lovely bridge by putting the board across two boxes, over which the children walk, jumping off at the end.

BOXES AND SAND

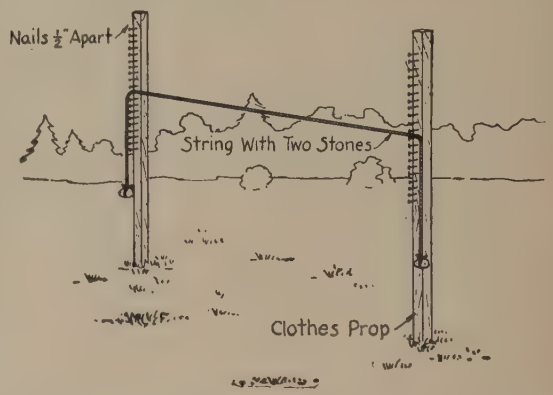
As we had a quantity of stout wooden boxes in our cellar, I have been eager to make use of them. Other people who are not so fortunate can obtain all they want at any provision store. Turning them upside down, we place several of them in a row, fairly close together, and the children jump from one to the other, pretending they are crossing a brook on stepping-stones. Then by lying on their stomachs across individual boxes, they are learning the swimming strokes.

Another most important feature of our gymnasium is our sand-box. Under a tree we have a good-sized one, made from two large soap-boxes, about five inches deep, nailed together with the inside partitions removed, making a large shallow box. A funnel, sifter, and a few spoons and jars are enough to keep a child happy for some time, and after more strenuous exercise forms a very acceptable means of comparative relaxation, and incidentally gives a busy mother an excellent opportunity to shell a few beans or pare potatoes. The children always find plenty to do in the sand of their own accord, but if you want to teach them geography, there is no better way than to make mountains, valleys, and islands. We also have a couple of smaller sand-boxes, each made from a single box, which can be moved about at will, in the sun or shade. During a continued rainy season, we even moved one of the boxes to the porch.

FOR VAULTING AND JUMPING

Another simple feature which we soon added was a planed 3 x 4-inch strip of lumber about 8 feet long. After Betty learned to walk across the board bridge, we let her try this narrow strip stretched across from box to box, putting it higher as she became more confident. She has also learned to vault very nicely over it, placing her two hands close together, and lifting her feet over with a single jump.

Nothing makes children more agile and graceful than jumping and running. For broad jumping only a piece of chalk or a stick is needed to mark the distance covered, but for high jumping I would suggest a simple device, similar to ours. I sawed a clothes-prop in two, and pointed the ends. Six inches above the ends I drove in a long row of small finishing nails, half an inch apart. We drive these sticks into the ground several feet apart, and measure the jumping ac-



curately by hanging a string across the nails weighed down at the ends by small stones tied to it. How hard we work to beat our own records! Even if Betty catches her foot in the string there is no danger of falling, for the string simply yields.

GYMNASTICS

A short ladder adds no end of fun, and such a lot of exercises can be invented for it. If it is placed flat on the ground, even the baby can step safely from round to round, and if it is raised about three inches, a little excitement is added without making it dangerous. When it is placed against a tree or side of the house, with the upper end about four feet from the ground, Betty loves to climb up and drop through. It also makes a splendid seesaw when placed over a low box.

I wish we had a good place for a long rope to hang in our yard. I have screwed one up in the corner of a shed, but we cannot swing on it very far without bumping into obstacles. Of course we have an ordinary swing with a little seat, but the hanging rope furnishes an excellent opportunity to strengthen the arm and leg muscles, as the children cling to it. Our rope can be used for climbing a short distance, and it

won't be long before Betty will be able to "shinny" up to the top, if she keeps on as she has started.

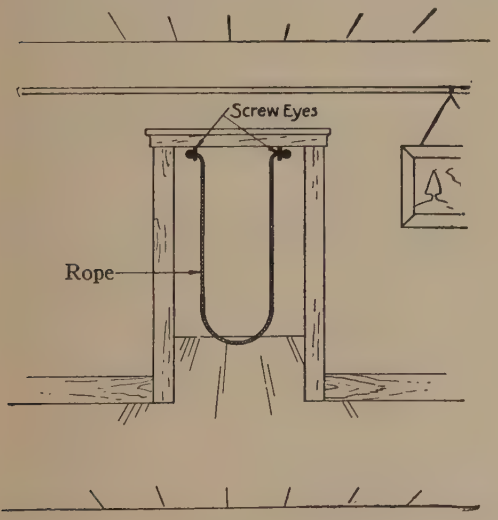
WHERE WE KEEP THINGS

Maybe it sounds as if our lawn were littered from one end to the other with boxes and boards, but with the exception of the large sand-box and swing, everything else can easily be put away, the sliding-board and long bars lying on their sides against the house, and the boxes piled neatly in an inconspicuous corner. We usually take out only one or two things at a time, so that in a jiffy our yard is in order.

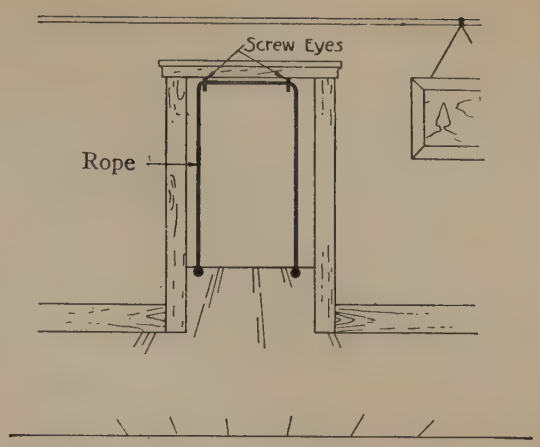
In addition to all the other advantages of an out-of-door gymnasium, it keeps the children perfectly contented at home, without the temptation to wander away. And as for stunts themselves, mother enjoys doing them every bit as much as the children, and she is sure her health is the better for it.

OUR INDOOR EXERCISERS

On rainy days, and on stormy days in Winter we take our exercise indoors with the windows open. Our first gymnastic device was a strong rope hung through two large screw-eyes fastened

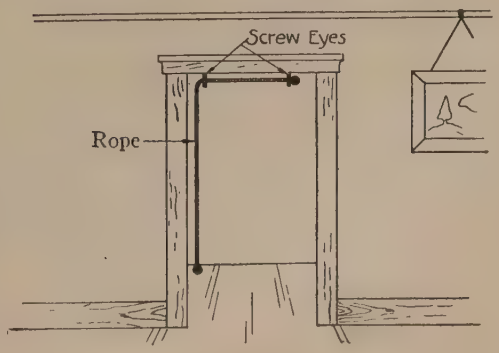


in the top of the doorway of Betty's bedroom. I intended it for an ordinary swing, and it is occasionally used as such, but by far its most popular use is pulling the ends down, making the two ropes parallel. Betty and even little Ann take hold of the rope with their hands, pulling their bodies from the ground and swinging back and forth. We always leave the rope in this position when we are through using it, as it does not hinder passing through the door. By pulling



one end of the rope completely up to the top, the other side makes a nice firm rope for climbing.

We have recently put up a trapeze in Ann's doorway. The bar across is made from an old rake-handle, sawed about six inches narrower than the doorway, and hung by two strong ropes to screw-eyes in the top of the door-frame, just high enough so that Betty can reach it by standing on her tiptoes. Swinging back and forth is in itself strenuous exercise, and I have been able already to note an increase in endurance. Betty hasn't yet mastered the art of pulling herself up and placing her chin on the bar, though Mother is glad to say that she herself can still do it. And even little Ann can hang all alone and swing, if someone lifts her up and takes her down when she is tired. There are lots of stunts that older children can do—sitting on the cross-piece, and skinning the cat, besides swinging in all sorts of ways. If you feel safer, you can place a small mattress under the swing, and the children will enjoy it just as much. I pull our trapeze all the way up to the top when I am through with it, to make a clear passage through the doorway, and to keep the children from using it when I am not with them.



An old iron bed, if you are fortunate enough to have one, furnishes unlimited opportunity for exercise. Climbing over the foot, walking along the edge, and jumping up and down in the center, supply the basis for many variations which the children will invent. We have occasionally brought our sliding board in, and put it against the side of the bed, letting the children coast down.

OUR SETTING-UP EXERCISES

In general the children seem to get plenty of exercises from their own play with the apparatus we give them, but once in a while we have a setting-up drill, which they enjoy immensely. Here are just a few of the things we do:

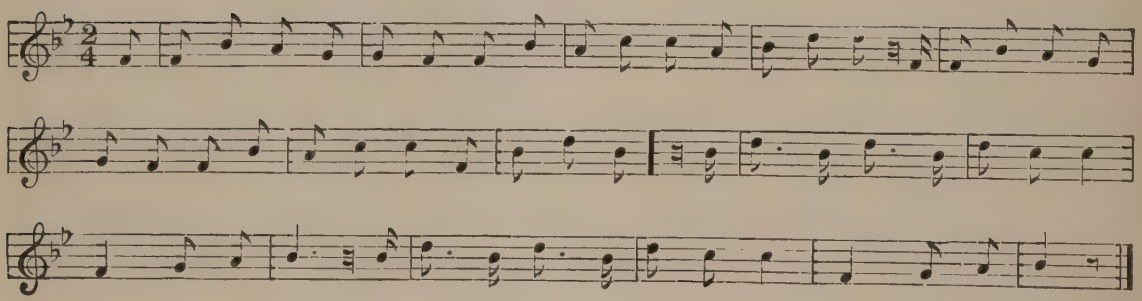
1. Raise arms slowly to horizontal position, breathing in.
   Hold breath, and strike chest lightly with closed fists.
   Let out breath and lower arms slowly.
2. Hands on hips, take running steps without moving from position.
3. Stand straight with heels together.
   Bend over and touch the floor without bending the knees.
4. Sit on the floor with feet straight ahead.
   Bend body forward as much as possible.

OUR FOLK-DANCES

We started to learn a few folk-dances when Betty was two-and-a-half. At that time I was teaching them to the Campfire Girls, who met at my home, and Betty joined right in with the rest. She loved them so much that I taught her several on her own account, simplying them to meet our needs. The following are a few which can be learned by very young children. The music can be hummed or whistled.

TAILOR'S DANCE

(Adapted from Miss Elizabeth Burchenal)



Partners face each other. Feet together. Place left hand on hip, and raise right hand as high as shoulder, hand closed, except second and third fingers, which are stretched part, pointing upward, representing scissors.

1st measure, 1st beat. Place left foot sidewise, heel touching the ground, and toe in the air.
1st measure, 2d beat. Left foot back to position. Close fingers.

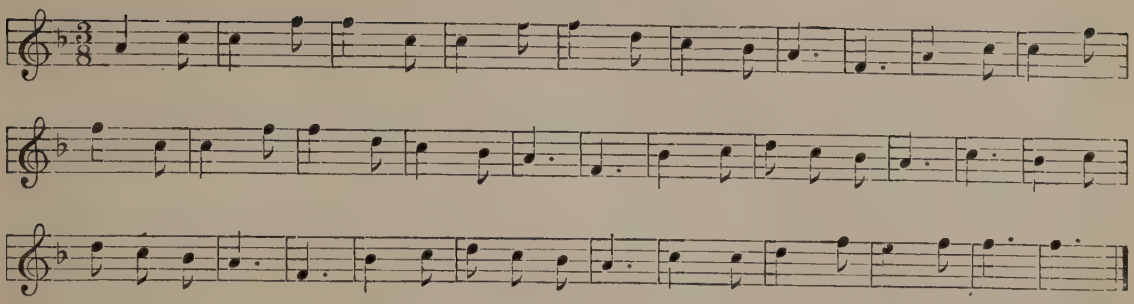
2d measure. Repeat.

3d and 4th measures. Partners join both hands, extended sidewise, and change places with four walking steps.

5th to 8th measures. Repeat all, only placing right hand on hip and raising left hand.

9th to 16th measures. All the couples join hands, and skip in a circle.

MORRIS DANCE (traditional)



Partners face each other, about four feet apart, arms straight above heads, waving handkerchief in each hand.

1st measure. Hop on left foot, raising right foot above twelve inches from the ground, knee stiff.

2d measure. Hop on right foot without moving forward, raising left foot twelve inches from the ground, knee stiff.

Continue till 16th measure.

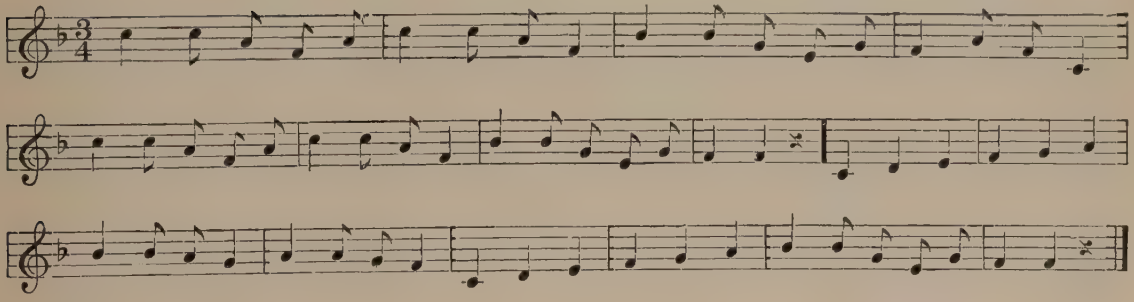
16th to 31st measure. Skip in circle, waving handkerchiefs at height of shoulders.

31st measure. Jump with both feet, handkerchiefs high in the air.

32d measure. Jump with both feet, handkerchiefs brought down to side.

REAP THE FLAX

(Adapted from Miss Elizabeth Burchenal)



Dancers stand in a line beside each other, hands on hips. (If more than five dancers, form two groups.)

1st measure. All bend forward to pick up flax.

2d measure. Raise it as far as waist.

3d measure. Throw it over right shoulder.

4th measure. Hands again on hips.

5th to 8th measures. Repeat,

9th to 16th measures. The one at the left end places hands on hips and leads. The rest place hands on shoulders of the one to the left and follow with running steps, three steps to a measure, around in a circle, ending in the same position at the 16th measure, and finishing by stamping twice.

1st measure. Dancers bend forward to gather flax.

2d measure. Return to standing position.

3d measure. Reach flax forward, as if to put it around hackle.

4th measure. Jerk it back from the hackle.

9th to 16th measures. Spinning the flax. Dancers close in a circle, with right shoulder toward the center. Reach right arms toward center, joining thumbs, left hands on hips. Run on tiptoes in a circle, three steps to a measure, for four measures. Turn around quickly and join left thumbs, running in circle the opposite way, till last beat. Let go of thumbs and form original position.

GYMNASTIC PLAYS

BY MRS. HARRIET HICKOX HELLER

THE modern nursery must not only be a play-acting place, but it must partake largely of the nature of a gymnasium. Especially is this true of lusty children. The adventuresome little fellow early likes to ride on Daddy's shoulder and will soon learn to walk on his own legs while holding fast to the firm hands. Many times he will do this, when at length with a little encouragement he will turn himself completely over, doing a sort of "skin-the-cat" stunt, which I have known children to enjoy, playing with the father until at length they had grown too tall to make the run. It is quite an achievement when a chap learns to turn a somersault, a real somersault, going clear over and not sideways, and to be able to turn two or three somersaults in rapid succession is a worthy nursery achievement. The hand-spring belongs to the mysteries of later development.

During the earlier part of the period that a child is interested in stunts, he enjoys lying flat on his back and letting his hands lie useless at his side, and then trying to raise himself to a sitting posture. It is an excellent exercise for certain muscles and affords amusement. From the same position it is well to lift his feet until the legs are in a vertical position. Many apparently strong children find difficulty in doing this until they have given it considerable practice. Then, of course, there is the ordinary little "setting up" exercise, which consists of standing in a military position; raising the hands high above the head and bringing the tips of the fingers down to touch the floor without bending the knees. These are in imitation of real stunts of larger people. The number of times a child can hop on one foot is interesting to him and may be increased by practice. The effort to be able to make as many hops with the left foot as with the right has some value. It is fun to march "following the leader," and doing all the queer things that he does. Even little children learn to skip to a rhythm, and the list of dance games which may be enjoyed in a spacious nursery is too long to be enumerated at this time.

SUITABLE GAMES

Variations of the game of "Hide and Seek," beginning with "Hide the Thimble," or, as the children say, "Hot Butter Beans," which consists of placing a small object in perfectly plain sight and guiding the searchers in their quest by the terms "Warm, warmer," and "Cold, colder," as they are near or far from the coveted object, are enjoyed by children of this age. The sending of a child from the room where a number of children are at play while the eyes of the rest are blindfolded is interesting to little folks. When they do not recall immediately the name of the child who has gone, they may be aided by the color of the hair or the eyes or some distinguishing characteristic. The regular game of "Hide and Seek," with a goal or "home base," is appreciated if it is not made too difficult. Some introductory phases of "Blindman's Buff," if we may so refer to them, such as "Still pond, no more moving," where the child walks out with his eyes shut, coming in contact with the children who have become quiet at his command, and then without opening his eyes tells which one he has, gives much amusement.

The ball is the great plaything of the world, and some little ball-games may be used by folks under five. Drawing a chalk circle in the middle of the nursery, it is interesting to try to roll the ball so gently that it will still remain in this circle. It requires more skill than at first is apparent. Placing the waste-basket in the middle of the ring, children enjoy tossing the ball into the basket. If there are but two or three children, some little count or score will need to be kept to keep up the interest. If there are many, the mere clapping of the hands and giving of another turn will be sufficient. To place a block of wood in the middle of the circle and roll the ball, aiming to strike it, also forms a pretty good game.

The following list of suggestions may be found helpful. They are recommended by Dr. Montessori as suitable physical exercises for little children.

SOME SUGGESTIONS FROM DOCTOR MONTESSORI

1. Hang a heavy, swinging ball from the ceiling. Two children sit in their chairs opposite each other and push the ball back and forth. This is an exercise for strengthening the arms and spinal column.

2. We don't know why children are so amused by walking on a line, but we do know that it is good exercise. Draw a chalk line on the floor

or extend a piece of white tape for ten or twelve feet for a child to walk on. This amusement is valuable in improving the carriage of the body.

3. Later, walking upon the edge of a plank supported by standards, takes the place of walking on fences. The effort is a training in bodily balance and it also develops courage. Hold the child's hand at first if he is timid.

4. Jumping is one of Nature's best exercises for developing strength in the legs and judgment in coördinating the movements. The eye, too, is trained in judging distances, and courage gradually develops. Guard the child at first, but let him begin to jump from one low step in this second year. Have a little flight of steps in the nursery, or use boxes of different heights.

5. Lines may be painted on the floor to measure child jumps. Jumping in and out of a circle is another game that children enjoy. Several circles, diminishing in size, are drawn inside of a large one. The child stands in the center and tries to see how far he can jump. Color in these circles adds to the child's pleasure.

6. The swing is needed for training in rhythmical motion and courage. Dr. Montessori suggests a broad-seated swing to support the legs in an extended position, the feet to strike a wall. This strengthens a weak child's knees.

7. Two small rope ladders are hung parallel to each other for the child to swing between. Another simple piece of apparatus is like a fence. A few parallel bars supported by uprights make such a fence, which gives the child opportunity to climb; also to walk sideways and even backward on the floor, is quite a feat in a child and is desirable for the exercise of certain muscles. Every mother knows how a child loves to play on a gate or a fence and to "saddle" along.

8. The child's legs are much shorter in proportion to the length of his whole body than those of an adult, and for this reason the child tires of the erect position, is apt to throw himself upon the floor, kick out his legs, climb, and jump, making many movements to strengthen his legs without knowing why.

9. Simple pieces of apparatus, such as the fence, the rope ladder, the swing, strengthen the hand in clasping and holding. Such movements must precede the finer movements necessary for writing and drawing and such handwork as sewing and cutting. The rhythmic games in marching, and the ball and bean-bags, kites, hoops and games of tag are valuable.

10. We should not make young children conscious of breathing exercises too soon, but they imitate deep breathing as a game. Deep breathing in the open air, accompanied by a few simple arm movements, will develop lung capacity.

11. In addition to the apparatus named, one may have a tree for the little ones to climb. An ordinary short stepladder is useful. A horizontal bar may be fastened in the doorway. Place a low bar for jumping over, and raise it gradually. It may be at first supported on the lower rungs of two chairs.

PLAYTHINGS WHICH THE FATHER CAN MAKE

BY WILLIAM A. McKEEVER, LL.D., AND JEAN LEE HUNT

THE ordinary busy father may easily find time to make a set of simple playthings for his children. He may thus also find a new avenue to the heart of the little ones. It will not be necessary to make many of these things at once, as two or three will be enough to satisfy the demands of the childish nature for change and variety. As these devices accumulate, some of them may be put aside for a while and brought out again later, to interest and delight the growing mind.

Home-made playthings, even though crude, are usually preferable to the highly finished shop toys. With the simpler ones it is easier to fit the individual needs of the child and to leave him some opportunity for initiative and adaptation. Whenever practicable, he should have a small part in cutting out and making his own playthings.

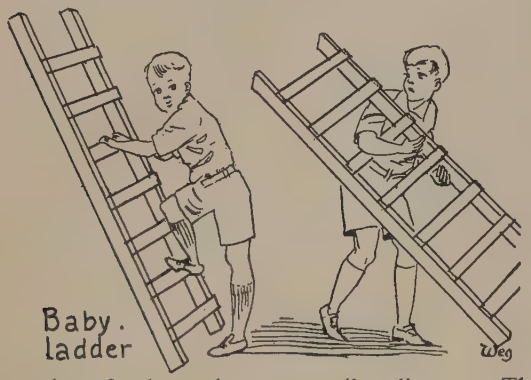
In the adaptation of the child to his home-made toys two or three matters should be carefully observed: first, to encourage initiative and independence—not to do all the playing for him; and second, to make the playthings a basis of fellowship between himself and others of his grade, and not a bone of contention.

Finally, remember that the play of children is not to be considered as mere fun and amusement, but as a necessary means of satisfactory growth and development of character.

THE BABY LADDER

It is necessary to indulge the childish instinct for climbing, and in order to do so one may easily make a simple ladder. The little one using the ladder will fall a few times, to be sure, but this

will illustrate Nature's best mode of instruction: that is, trial and error. The ladder is constructed out of two light white pine strips 1 x 2 inches and 5 feet long, for the sides, and other strips the same size and 14 inches long for the rungs. Nail



together firmly and remove all splinters. The three-year-old will obtain much pleasure from this light device and will carry it far and wide in the course of his play.

THE NAILING BLOCK

Secure a pine block 6 x 6 inches and about 2 feet long, also a small hammer to suit the size of the child and a quantity of sharp-pointed shingle nails. Show the baby learner how to use these, starting him right from the first. Both boys and girls enjoy the benefits of this interesting and instructive device. After the child has acquired ability to wield the hammer with considerable ease, various figures may be marked on the block for him to trace out by driving nails upon the lines. Have him print his name thus.

THE BUILDING BLOCKS

Building blocks never cease to interest the baby and to develop the infant ingenuity as well. They may be used indoors or out and they fit well into the play about the sand-box. In order to make the blocks most convenient for symmetrical structures, cut them in two lengths, a third or more of them being exactly one-half of the length of the others.* A strip of white pine 1 x 2 inches and cut as suggested above, say, in 4-inch and 8-inch lengths, will serve the purpose well. See that all are planed smooth and are free from splinters.

THE CHAIR-SWING

The child never ceases to love the swing. But to be useful the swing must have character, must fit the child nature and indulge the impulses properly. In making a swing for the little one, therefore, observe these directions carefully:

1. Suspend the swing on a beam that is both firm and level. If the beam sags, the child will quickly tire.

2. Spread the ropes or chains fully twice as wide apart at the top as they are at the bottom, and thus insure a steady, even, to-and-fro movement. Otherwise the swing will wabble and so spoil half its value.

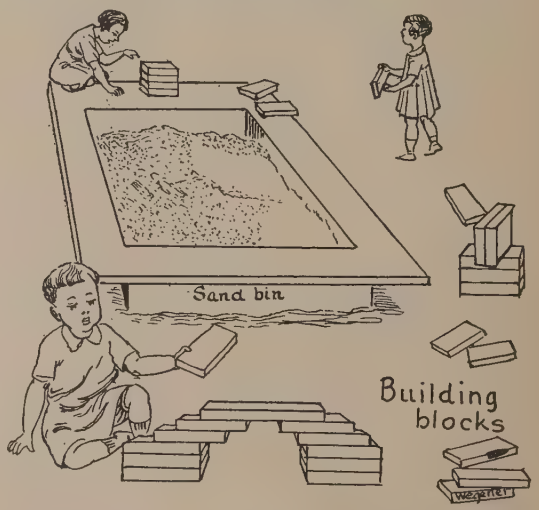
3. Make the seat broad, comparatively firm, and suspend it just high enough for the child to catch with his toes and swing himself. If the feet are not thus put into service, the child will become dependent, or angry because he cannot make the thing go.

Make the chair-swing as follows:

The seat one foot square—the end of an egg-box will do. Bore five-eighth-inch holes in each of the four corners.

Cut four wooden strips 1 x 1 inch and 1 foot long and bore holes in both ends of these to match those in the seat, so they may be used for sides, front, and back.

Secure four 4-inch tube insulators, to stand under the four strips described above, and keep them up as supports for the child.



* Mr. H. G. Wells, in his book, "Floor Games," gives the following as the proper sizes for such blocks: Whole blocks, 4½ x 2¼ x 1⅛ inches; half blocks, 2¼ x 2¼ x 1⅛ inches; and quarters made by sawing the latter in two. Almost any wood may be used to make these blocks except that which is likely to split or splinter or that which readily warps. In the northern and western States, maple and birch are usually available; in the South, short-leaf pine and yellow poplar; and in the Far West, the sugar pine or western white pine. Basswood, beech, or sycamore may be used. Blocks of hardwood, like oak, may be passed down from one generation to another. A box or chest to keep them in is almost a necessity. In addition to the blocks—from which no end of things can be constructed—Mr. Wells likes to have some play boards of the same wood. 18 x 9, 9 x 9, and 9 x 4½ inches. These boards make oceans, islands, States, counties, platforms, stages, and may serve also as roofs, walls, tents, and targets. There can hardly be too many of the blocks, but a hundred will make a fair start.
—*Editors.*

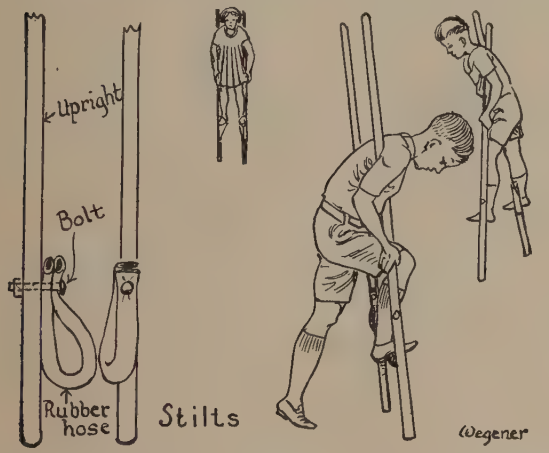
Cut a 25-foot length of quarter-inch rope into two equal parts, each to support one side of the swing. Pass the ends of each piece of rope down through the holes in the side strips, the tubes and the seat below, tying a firm knot underneath.

Now pick up the two rope loops, hang them on two hooks of equal height, press the seat down level, and notice where the hooks dent the ropes. From that point flatten the two diverging strands together downward and loop them into a knot. Finally, hang the swing again, and level the seat be readjusting the two knots.

This swing may be hung outside, may be carried on picnic trips, may be suspended in a double doorway, or even in a common doorway.

THE STILTS

Stilts are very attractive to children if made to fit the age and development of the player. For the four-year-old begin with broomsticks. Pierce these with a gimlet a few inches from the

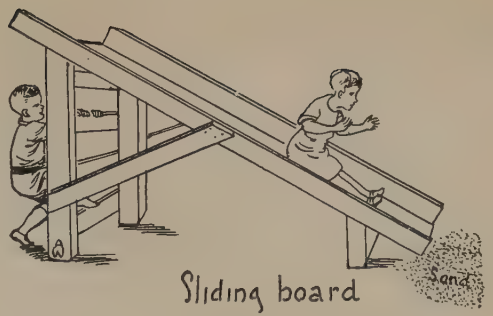


larger end. With a piece of old garden hose make a loop large enough for the child's foot to slip in easily. Pierce the lap-ends of this loop and pass a long stove bolt through the rubber and the hole in the broomstick.

For older children use a stouter staff and raise the loop higher gradually, by having a series of holes for adjustment. After due practice boys may walk on stilts four feet from the ground. Bring a group of these together and have a stilt parade.

THE SLIDING-BOARD

The sliding-board has proved its worth as a popular plaything, although some have constructed it carelessly and used it unintelligently. For the smaller child at home, a trough of wood may be easily constructed as follows:



Obtain for the bottom a smooth 14-inch board, 10 to 14 feet in length, and use 1 x 2-inch stuff of the same length for the sides. Decide as to the upper end of the board in accordance with the direction of the grain, and so avoid splinters. Rub the trough down well with sandpaper and with a full coating of ordinary floor wax.

Secure the upper end of the slide to the edge of a platform or box, allowing a slope of about 45°. Arrange a ladder or cheap stairway for reaching the top of the slide, placing banisters and supports where needed. At the lower end of the trough there may be a shallow sand-pit or some other provision for a soft landing.

Teach the little ones to take their turn here and to assist one another.

THE CLIMBING-ROPE

Children are not strong enough in the arms to climb a vertical pole or rope, but they may develop much vigor from ascending a rope stretched diagonally. Therefore secure one end of a ¾-inch rope to a post or tree at a point just within reach of the child. Now draw taut as possible and fasten the other end similarly but considerably higher, say at a slope of 45°.

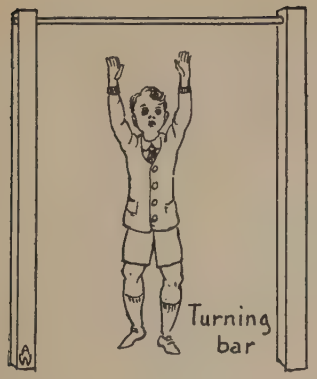
Rub the rope down with wax or oil in order to give the hand a secure hold and to prevent the fibers from pricking. There is little danger of falling. However, the ground below may be padded with some soft material in order to encourage the beginner or the timid child.

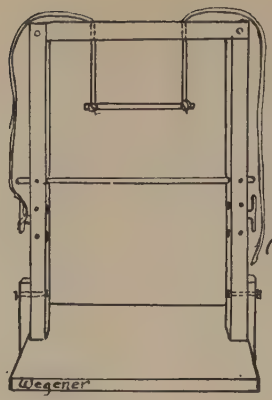
This climbing exercise is an excellent lung-developer.

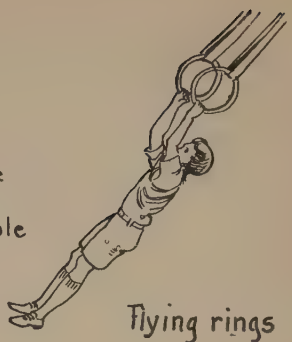
THE TURNING-BAR

To develop the muscles of the arms and chest and send the red blood outward from the heart, turning on the bar is scarcely to be excelled. If started upon this exercise in mere babyhood a child grows especially fond of it.

Ordinarily half-inch gas pipe makes a good bar for children. Obtain a four-foot piece from







the plumber and have him attach flanges at the ends for nailing the bar up between the posts. It must be perfectly firm and must not turn in the hands. Hang barely within tiptoe reach of the child.

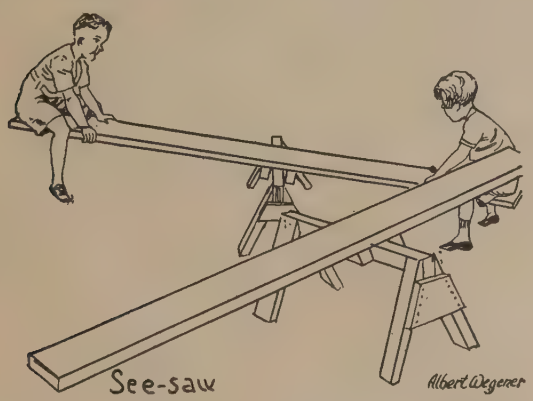
A trapeze of the same material and swung at the same height is also good. The swinging motion adds to the charm. Hang also a gas-pipe hoop about thirty inches in diameter. This lends itself to several extra turns and contortions.

THE SEESAW

Board—Straight grain lumber, 1⅛′ x 9″ x 12′-0″.

Two cleats 1¼″ x 9″ bolted to the underside of the board to act as a socket on the hip of the horse.

Horse—Height 25″. Length 22½″. Spread of feet at ground 20″. Legs built of 2″ x 3″ material. Hip of 2″ x 3″ material. Brace under hip of ⅞″ material.



Note—All figures given are for outside measurements. Apparatus, except seesaw board and sliding-board, should be painted, especially those parts which are to be put into the ground.

THE TRAPEZE

Two Uprights—3″ x 3″ x 6′-10″.

Top Piece—3″ x 3″ x 2′-10″.

Ends of top piece secured to uprights by being mortised or halved and bolted together.

Uprights rest on bases of 2″ x 3″ material, 3′-7″ long, connected by a small platform in the form of an H.

Bases and uprights are bolted to dogs or pieces of wood 2″ x 4″ x 5′-8″ set in the ground about 3′-0″.

Adjustable bar (round) 1⅜″ diameter.

Three holes bored in each upright provide for the adjustable bar. The first hole is 3′-0″ above ground, the second 3′-5″, the third 3′-10″.

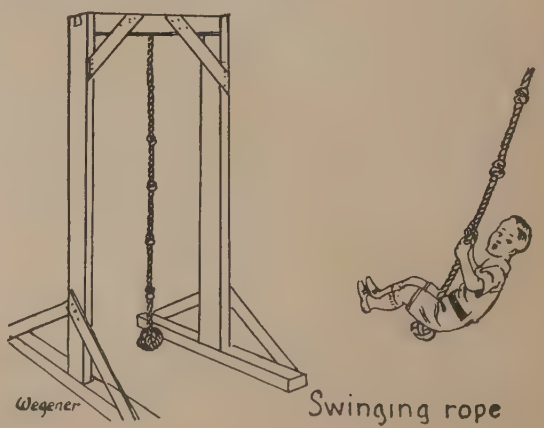
Swing bar (round), 1⅜″ diameter, is 20″ long. Should hang about 16″ below top piece.

Two holes ⅝″ diameter bored in the top piece receive continuous ropes attached to the swing bar by being knotted after passing through holes (⅝″ diameter) in each end of the bar blocks.

THE SWINGING-ROPE

Upright—3″ x 3″ x 6′-9″.

Top Piece—3″ x 3″ x 2′-9″.



Upright and top piece are mortised or halved and bolted together.

Bracing at top (3″ x 3″ x 20½″ at long point of miter cuts) is nailed to top piece and upright at an angle of about 45°.

Upright rests on a base measuring 3′-0″. This is mortised together and braced with 2″ x 3″ material about 20″ long, set at an angle of about 60°.

Unless there are facilities for bracing at the top, the upright should be made longer and buried about 3′ in the ground.

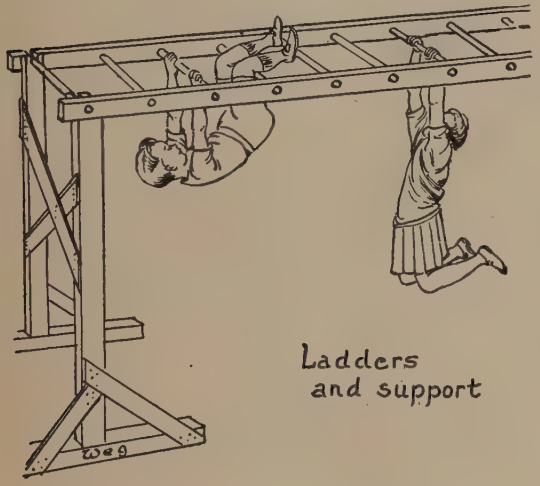
The swinging rope (¾″ diameter) passes through a hole bored in the top piece and held in place by a knot. Successive knots tied 8″ to 9″ apart and a big knot at the bottom make swinging easier for little folks.

THE LADDER AND SUPPORT

Ladder—14″ x 10′-2″.

Sides of 1½″ x ½″ material. Rungs ¼″ diameter set 10¼″ apart.

At upper ends of the sides a U-shaped cut acts as a hook for attaching the ladder to the cross bar



of the support. These ends are reënforced with iron to prevent splitting.

Support—Height 4′-6″. Spread of uprights at base 4′-2″.

Uprights of 1½″ x 2½″ material are secured to a foot (1½″ x 4″ x 20½″) with braces (11½″ x 2½″ x 12″) set at an angle of about 60°.

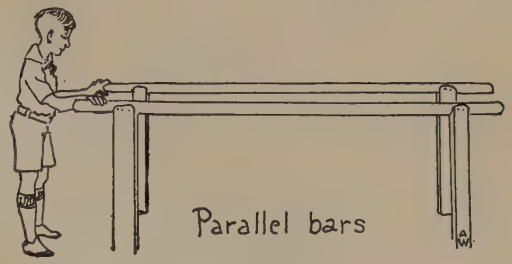
Tops of the two uprights are halved and bolted to a cross bar 1⅛″ x 2½″ x 10″ long.

The uprights are secured with diagonal braces 1⅜″ x 3½″ x 3′-9″ fastened together where they intersect.

THE PARALLEL BARS

The two bars are 2″ x 2¼″ x 6′-10″ and are set 16½″ to 18½″ apart. The ends are beveled and the tops rounded.

Each bar is nailed to two uprights (2″ x 3″ x 5′-0″) set 5′ apart and extending 34″ above ground. An overhang of about 6″ is allowed at each end of the bar.



THE CAVE OR DEN

Children delight in an underground retreat of their own. Boys especially pass through an age of burrowing. A miniature "robbers' den" is what they want.

A quantity of loose brick, some good-sized dry-goods boxes to be torn down for the lumber, and some utensils for digging, are the requisite here. Lay off the plan roughly, give a few suggestions, and turn the boys loose to do the work for themselves. Now, watch them imitate primitive man as they proceed to make a place to live and hide their plunder. Some toy weapons, fortifications, and other evidences of the defensive instinct may be expected to develop here.

THE PLAYHOUSE

An outdoor playhouse may be constructed without any considerable expense of time and money. Such a structure soon becomes a popular place of sociability and play for all the little ones of the neighborhood. Make the house as follows:

Frame up a sand-box for outdoor use and consider this as the foundation of the house. Nail firmly to this the necessary number of 2 x 4 uprights 6 or 8 feet long. Frame up above as for an ordinary comb roof. Brace the corner uprights. Cover the roof with sheathing and with one-ply tar paper to keep out the sun and the major part of the rain.

Leaving a space for the door or entrance, cover the sides all round with heavy-strand woven fencing-wire having the square mesh. This wire lets in the light, keeps out the "enemy," and is good for climbing (for the children) and for the trailing vines which may be grown on the outside.

The floor of the house is covered with four to six inches of sand. Seats, blocks, a hammock, a chair, a swing and other childish bric-a-brac may all serve as furnishings. Here the story-hour may be enjoyed, or the mother may sit with her handwork while the little ones play.

LIVELY IMITATIVE PLAYS

Little children are not especially fond of formal gymnastics, but it takes only a little ingenuity to arrange imitative plays in such sequence as to exercise in turn the big body-muscles, the lungs, the heart, and the abdomen. Some of these have been suggested by Marion B. Newton.

MOTHER GOOSE EXERCISES

1. "Simple Simon." Two children walk quickly around the room, meeting, touching hands and passing on. At "the fair" Simple Simon sees—
2. "Yankee Doodle." At this point the children pretend to ride on ponies, dancing to the time of the old rhyme.
3. "Jack be Nimble." They jump over a low stick as this quatrain is repeated.
4. "Old King Cole." They march in step to the rhyme and pretend to be fiddling.
5. "Little Boy Blue." They take deep breaths and blow into a horn, and then lie down and pretend to sleep.

CIRCUS PLAYS

1. Trained Dogs. They hop about on two feet, with knees slightly bent and hands hanging in front of the chest, jumping up on stools or boxes and then down.
2. Tight-Rope Walker. They walk along the top of a narrow plank, such as a 2 x 4.
3. Trapeze Man. They hang from a broomstick or other rod fastened into ropes, hanging from a tree in the yard or in a doorway in the house.
4. The Strong Man. They swing a heavy imaginary hammer up and down upon an imaginary post, and then throw it far into the air.
5. The Tall Man. They walk about on tiptoe, with their arms stretched high overhead.
6. At last they play, they buy toy balloons, and blow them up themselves.

IMITATING THE CITY HELPERS

1. The Policeman walks around, straight and tall, swinging his club and blowing his whistle.
2. The Fireman climbs a ladder, "rescues" a doll and hastily descends.
3. The Street Cleaner makes the motions of brushing and shoveling.
4. The Messenger Boy runs very fast, delivering messages.
5. The Bell Ringer leans down and up and swings his body as he pulls the church bell rope down and up.
6. The Mounted Policeman gallops and canters on his splendid horse.
7. The Band Master fills his lungs and blows his trumpet, then swings his hand to the band and leads off the procession.

IMITATING THE HOME SIGHTS AND EVENTS

1. The Rooster stands on his two feet, throws his chest forward and his head back and crows several times, taking in a full breath before each crow.
2. The Farmer sows the seed, carrying his sack of seed under his left arm and moving forward with a large rhythmic movement of his right arm.
3. The Windmill swings its arms slowly from the earth in a complete circle through the air.
4. The Rabbits hop about the lawn and nibble the clover.
5. Greyhounds take long leaps over cushions on the floor. Puppies frisk about with shorter steps.
6. Monkeys climb poles and get up into the lower branches of safe trees.

Many other imitations will suggest themselves to mother and to child.

PHYSICAL FITNESS

PHYSICAL EXERCISE FOR GIRLS

BY WILLIAM J. CROMIE

A GENERATION ago the women of this country wore on their dresses long trailing trains, which were decidedly unhygienic. The dresses of girls of fourteen reached the shoe-tops, and those of sixteen-year old girls fell to the ankles. These women and girls also wore high, close-fitting collars, which completely covered throat and neck, and were conducive to colds and throat affections. To-day the dresses are short—quite short—in fact, stockings and dresses in some cases fail to meet. Most of the dresses now are collarless, while those in use are small, low cut, and turned down rather than up. Why do we have this radical change in dress? It is in the main one of the results of physical exercise. Girls and women can not play golf, tennis, and hockey, nor bowl, run, and jump with tight and encumbering dress.

Until just before the World War began, the swimming suit worn by women included a long heavy skirt, reaching almost to the ankles, which greatly impeded free motion while in the water. Women would never have experienced the success attained in swimming were it not for the light one-piece suit now universally worn.

In the summer of 1926 Miss Gertrude Ederle of New York swam the English Channel, making a new record against former competitors, all of whom were men. A few weeks later Mrs. Clemington Corson, also of New York, and the mother of two children, was the second woman to successfully swim the treacherous waters of the Channel. Although she did not equal the time of Miss Ederle, she surpassed that of the five men who had previously conquered the Channel. While these records were later broken by men, the fact still remains that records held by men for many years were broken by these two women. It takes skill, strength, nerve, and endurance to swim the English Channel, and these qualities were undoubtedly acquired in the performance of earlier physical exercise by these two women. Surely this phenomenal feat exemplifies the results of physical training.

More schools and colleges are each year requiring physical training as part of the curriculum, while many churches, the Young Men's and Women's Christian Associations, Jewish centers, clubs, societies, and institutions, regard the gymnasium, athletic field, and swimming pool, as necessary accessories of man's highest development. Why is it that each year more and more interest is manifested in physical training? Why do the daily papers devote one or more pages to manly sports or games, while our magazines have interesting and instructive articles upon the subject? Why do business men, shop and factory owners find it to their advantage to relieve those in their employ from work on Saturday afternoons? Why are the municipalities throughout the country advocating more elaborate playgrounds and swimming pools for the children who live in our densely populated cities?

When a young man or a young woman enters college a physical and medical examination is given and exercise is prescribed to suit individual condition. Measurements of muscles are taken, and strength tests are given, in order to note improvement and more readily determine the results of physical training courses. Measurements and tests are again taken at the completion of the college course.

If a student is required to take physical training two periods or more a week, as in the school and college, it will be observed that his muscles are larger and stronger and his general health is better at graduation than when he matriculated. On the other hand, the man who fails to take muscular exercise will eventually suffer from indigestion, nervousness, and sleeplessness, and at the end of *his* college course, instead of being at his best, he will be handicapped physically as he really begins the battle of life.

Since the colleges and schools have taken up the subject of physical training more interest has been manifested in its development. Newspapers are giving more space to competitive sports and games

because the successful contestants are to-day regarded as heroes, and the people seek this kind of news. Many employers give their help Saturday afternoon off because more and better work is performed. When a person is allowed to witness or indulge in his favorite sport on Saturday, it diverts his mind from business cares and he returns to his work rested and in a more cheerful condition.

The World War revealed the fact that the rank and file of men drafted for service in the United States were not up to the physical standard required for service. This deficiency in physical stamina was influential in causing many States to require physical training as a part of the curriculum in the school systems. During the War about twelve States had compulsory physical education, while to-day the majority of the States require systematic body-building exercises in the primary, grade, and high schools. This will soon result in a stronger race of men and women.

The muscular system is divided into two groups, voluntary and involuntary. The first are those which are subject to the will, and they form the bulk of the muscular system; while the second group are those over which the will has little or no control, but which are stimulated to action by some other agency. Each muscle, or group of involuntary muscles, has its proper stimulus, and these are placed within the cavities of the body and are employed in the vital processes of digestion, respiration, assimilation, and elimination.

One of the first observed results of daily systematic exercise is enlargement of the muscles. They not only increase in size, but their structure is at the same time changing. They lose the fat which infiltrates their fibres, and are reduced to their own proper elements. It is this change of shape, or increase in size, that delights the one who exercises. He may not know that fat is being burned, and that chemical changes are taking place, but he does know that he is becoming stronger and more symmetrical, and, consequently, he takes more interest in his work.

As activity of the muscle increases its size, so inactivity decreases it. Almost everyone knows that the muscles of an arm carried in a sling soon wither away and become weak. Refuse to use what we have and Nature will take it away. Make an effort to use it again and she will gradually restore it to its normal condition. It is said that Nature has removed the sight of the fish in Mammoth Cave, Kentucky, because, being in darkness, their eyes are no longer used.

Some people think that one exercises for the sole purpose of obtaining big muscles. Certainly this result follows when one goes into training for this specific purpose, but it is one of the least intelligent reasons for physical training.

By exercising the voluntary muscles one thereby strengthens the involuntary, by stimulating the respiration and increasing the circulation of the blood. With every movement such as walking, breathing, and even thinking, certain cells are destroyed and must be replaced by others. This work is performed by the blood, which carries the wornout cells to the lungs, skin, and kidneys and these discharge them from the body while the blood, ever busy, lays down new material. *Vigorous exercise* tears down weak cells and the blood, quickened by this stimulus, replaces the dead cells by the stronger living ones. Thus one who exercises daily will soon become possessed not only of large and strong voluntary muscles, but the involuntary will at the same time improve.

If one goes to a gymnasium and observes a group of girls working according to the instructor's orders, she will probably be surprised that the same prescription of muscular movements can be suitable for such different temperaments. She at once asks herself the question, how can the same exercise be successfully applied to both the fat and the lean. Let us go to the same gymnasium six months or a year later and note their physique. The fat girl has lost weight, the symmetrical outline of her muscles is observed, and she works with more ease and grace than she did when she entered the gymnasium. The lean girl has gained weight. She has a brighter countenance and her general appearance indicates a more vigorous life.

The reason the fat has lost weight and the lean gained it is due to the fact that exercise fulfilled two physiological necessities. The heavy girl's system was overcharged with fat, and vigorous exercise eliminated or burned it. In the thin girl's system there was an urgent need of a stimulus capable of arousing the digestion and assimilation to increased activity, and this stimulating agency was found in muscular exercise. When more food is assimilated it naturally follows that the weight of the body will increase.

The most important result of physical training is observed in an increased respiration and this in turn stimulates the circulation of the blood. Under the influence of this oxygenated blood the heart performs its work with increased energy and pumps this life-giving stream to all parts of the body.

Most of our present-day literature contains reference to the physical perfection of the early Greeks. The strong man is described as one whose strength is Herculean, the symmetrical athlete is called an

A FIGURE 4 B

Fall out right sideward as in "B," arms, body, and left leg in line, both heels on floor. Return to starting position and fall out left sideward. Children may cultivate grace and command of body with these movements.

FIGURE 5

Grasp the toes or instep of the right foot as in "A," lower the body till the knee touches the floor as in "B," then return to starting position without releasing the grasp of the foot. It is easy to go down, but to return is quite difficult. The secret of returning is to bend well forward from position of "B." Perform the exercise first with the right leg, then with the left.

A FIGURE 5 B

A B

FIGURE 6

FIGURE 6

Raise the left leg as in "A," hold the leg in that position and slowly sink to a full bent knee posture as in "B." Keep the leg straight and return to starting position. This, like the preceding movement, is difficult upon arising from the bent knee position. While mastering this exercise assistance may be secured by holding lightly to a chair or by touching the finger tips to the floor, as in "B," for balance. It is well worth striving to become adept in this exercise, as it requires wonderful balance and develops the thigh and leg. Do this "stunt" with the right leg, then the left.

FIGURE 7

Lie prone on the floor with the hands on the floor under the shoulders. Push up to a front lying support, as in "A." Jump between the hands as in "B" to a supine lying, as in "C." When jumping between the hands as in "B," learn to support the weight of the body upon the finger tips. The body, while passing between the hands, should be well doubled up, knees to chest and heels to hips, and the change should be made in one movement without a pause. It may take a considerable number of trials before one can do this quickly and well.

A B C

FIGURE 7

A FIGURE 8 B

FIGURE 8

The backward bend is accomplished by kneeling on the floor, as in "A." Hands on hips, knees together, and bend back slowly, back arched, till position "B" is reached. Return to starting position. This feat is quite simple if the knees are separated, but difficult if the knees are together, as the tendency is then to fall sidewise. The hips should not touch heels in the bending.

FIGURE 9

In pulling an opponent's hands apart, "A," having placed her finger-tips together in front of her chest, "B" endeavors to pull them apart. This is an impossible task if both contestants are of equal strength. This is a good exercise for the chests and arms of both persons. Exercises of a companion nature, wherein the skill, strength or endurance are combatted one against the other, are more interesting than exercises performed by one's self.

FIGURE 9
A B
(*left*) (*right*)

A FIGURE 10 B

FIGURE 10

The human wheelbarrow appeals to children on account of the unique mode of locomotion. "A" grasps "B's" feet and "B" travels forward one hand after the other, after which the process is reversed. This may be made more difficult by "B" slapping the chest before each step. Do not push the barrow too fast.

A FIGURE 11 B

FIGURE 11

"A" and "B" stand facing each other, clasping hands. "B" sinks from position "A" to a full bent knee position, as in "B." As "B" arises "A" lowers body to the same position. This is a see-saw movement; one person goes down as the other rises, each assisting the other in the balance.

FIGURE 12

"A" and "B" sit back to back, knees up, feet close to hips. From this position they press strongly against each other's shoulders and hips, and arise, as in "C" and "D." They then return to the starting position.

A B FIGURE 12 C D

FIGURE 13

"A" and "B" lie on backs on floor, bodies facing in opposite directions. The shoulders are side by side, touching, arms interlocked. "A" and "B" each raise the near leg, interlock at heels, and pull. The weaker of the two will perform a backward roll, as may be observed in the case of "B," in the illustration. Try the stunt with the left leg, then the right one.

B (*top*) FIGURE 13 A (*under*)

A B FIGURE 14 C D

FIGURE 14

In hand wrestling the contestants should be about the same weight and height, as extra weight and a long arm gives one the advantage. Each of the opponents should place the inside of the right foot as in "A" and "B," or the outside of each foot may be facing. Each grasps the right hand and pushes or pulls. The object of the exercise is to force the opponent to raise the toes by pushing, as in the case of "B" to "A." Again force the heel to be raised from the floor by pulling; "D" has overbalanced "C" by this method. Each time a contestant forces the other to raise toes or heel it constitutes a point. The feet should not be more than thirty inches apart. To maintain a good balance bend the front knee when pushing or being pulled forward and the rear knee when pulling or being pushed backward.

FIGURE 15

In toe wrestling, sit on the floor as in "A" and "B," with broomstick or wand under the knees, elbows under stick, and hands clasped in front of legs. The object of the game is to push on the toes ("A" and "B") hard enough to roll the other backward, as in "D." The closer the heels are to the hips, the more likely one is to be forced backward. Keep the weight of the body well forward and resist the impulse to lean backward when pushing.

A B C FIGURE 15 D

A FIGURE 16 B

FIGURE 16

The above exercise is sometimes called rooster fighting. Stand on one foot with arms folded and try to upset the other by causing her to place the suspended foot upon the floor. The arms must remain folded while each bumps the other with arms or shoulders.

FIGURE 17

Lift and fall, body rigid. Lie on back, as in "B." Keep body stiff. "A" places hands under neck of "B" and lifts to "C" position. From "C" keep body stiff and fall forward as in "D." In falling be sure that the break of the fall is upon the hands. Practise this fall at first upon a mat or soft cushion. The tendency in both lift and fall is to double up at the hips.

A B FIGURE 17 C D

A B C D E

FIGURE 18

FIGURE 18

The lift by the feet is much more difficult than the preceding lift. "B" lies on the back with each hand palm down on floor at side of head. "A" grasps the ankles of "B" and lifts to a head balance as in "D." "B" must keep the body stiff and support its weight upon the hands. After the position of "D" is reached "C" pushes "D's" feet away as "D" pushes with hands and lands in "E" position. After a few trials "E" may finish the movement in an upright position.

A B C D

FIGURE 19

FIGURE 19

Every normal adolescent boy and girl yearns to and should learn to do a head and hand balance. Place the hands on the floor about width of shoulders apart, fingers well spread, as in "B." From this position lower the head to the floor about six or eight inches in advance of the hands, arch the back and throw the feet upward, which will be grasped by "A." From the "B" position "C" pulls on the ankles and "D" pushes on the hands, which will bring one to the hand balance "D." From this position "C" pushes the feet away and "D" bends at the hips, bringing the feet down toward the hands, alighting in the upright standing position. In all of these companion exercises each should alternate with the other.

FIGURE 20

The double roll is a very clever exercise and not so difficult as it appears in the illustration if practised carefully. "A" lies on back with knees raised. Each grasps the ankles of the other, as in "A" and "B." From this position "A" spreads the knees and places the soles of the feet close to the hips on the floor. "B" rolls forward, body well doubled up, with head close to hips of "A." The impetus of "B" going forward will bring "A" to "B's" present position, when the process is repeated. Four, five, or more of these rolls may be performed. Stop and go backward by reversing the movement.

A FIGURE 20 B

FIGURE 21

In the "walking elephant" "B" sits astride of "A" above the hips with legs crossed in rear. "A" then holds "B" under the hips while "B" arches the back and bends backward slowly till position of "A" and "B" is reached. "B" then crawls forward between feet of "A" and grasps "A's" heels. "A" then bends forward and becomes "D" in opposite figure. From "D" and "C" position "A" or "D" travels forward, alternating hand and foot.

A B FIGURE 21 D C

A FIGURE 22 B

FIGURE 22

Every girl desires to be graceful and dance well. The three following exercises, while very difficult, are well worth while mastering. It may take years of practice of the forward, sideward, and backward balance before one does them easily and well, but if persisted in they will eventually give wonderful control of the muscular groups of the body. From the upright position of "B" lower the trunk forward to an angle of 90 degrees, right leg backward and arms forward. Head, shoulders, hips, and leg should form a straight line. "B" assists and informs one when the body is in the proper position.

A B FIGURE 23

FIGURE 23

In the sideward balance "A" bends sideward to the right and raises the left leg, as in "A." The hands may be placed on the hips, back of head, or straight in a line with the extended leg. The left arm in line with the leg and other hand on hip makes a symmetrical pose. In all three of these balances the one leg should be used, then the other. "B" assists.

FIGURE 24

This is the most difficult of the three poses; in fact, many classical dancers fail to do this as it should be done. From starting position bend backward and raise left leg forward as in "A," assisted by "B." The hands may be placed on the hips, back of the head, or arms in a straight line with leg. Eventually these three exercises should be performed without the assistance of "B." After these are mastered, a very striking pose is accomplished by using Figure 24, arms straight over head. Hold in that position and perform Figure 23, then Figure 22. Repeat with other leg.

B FIGURE 24 A

TUMBLING AND PYRAMIDS FOR BEGINNERS

BY H. DARNELL BRITTIN

BILL STUBBS, Alex Monroe, and George Tomkins were high-school sophomores in the town of Spottsville, which means that they were no different from other American high-school sophomores in other American towns. This trio of unbounded energy, having just returned from a visit to the famous Ringling Brothers' Circus, were earnestly and enthusiastically discussing the merits of the various troupes of acrobats. One group in particular, the Donezetta Family, with their amazing acrobatics, fearful falls, and death-defying demonstrations, occupied the center of the conversational stage—how they performed this somersault or that flip-flop, and how they always managed to land right side up. But in their wonderment they had forgotten one thing: the Donezetta Family had reached their present stage of perfection only through beginning with the most simple figures, and progressing just as our expert cost accountant or mathematical expert began with two times two are four.

So, for the joy of being able to perform simple acrobatic figures and thus acquiring an extra sense of bodily control rather than placing an emphasis upon professional tumbling, is this little article written. Let us put on a pair of sneakers and go with Bill, Alex, and George to a gymnasium or

grassy lawn and try some of these easy stunts that 'most everybody can do without danger of dislocating the various vertebrae of the neck.

We'll begin with something easy, of course. Bill and Alex stand back to back and lock elbows. Bill leans forward at the waist, lifting Alex, who places his feet in the air. Now Bill straightens up and Alex does the lifting. They repeat this about a half-dozen times and call it the rocking-horse stunt. Nothing to it.

George and Bill stand facing the same direction. George, being the smallest of the bunch, places his hands on the ground. Bill is the strong man of the group and grasps George by the legs, so that George can lock his ankles in back of Bill. This looks something like a wheelbarrow. Bill, supporting George with his hands at Bill's waist, circles rapidly to the left, while George clasps his hands, and a "Whirling Dervish" hasn't anything on Bill and George.

Alex and George sit down on each others' feet and grasp arms (see Figure 1). Alex leans back, pulling George toward him, and then straightens his legs off the ground. George returns to earth, leans

FIGURE 1.—THE ROWBOAT

back and bends his legs and again returns to terra firma. They repeat, taking turns about, which means that, after a little practice, they are able to "travel over the bounding main in their little rowboat for two." And if another fellow were there besides Bill, they could hold an exciting race.

Alex straddles Bill across the chest under the armpits and locks his ankles in back of Bill. Keeping his ankles locked, he lowers himself between Bill's legs and grasps the rear of Bill's ankles. Bill bends forward at the waist and places his hands on the ground. Keeping his knees stiff, he proceeds on all fours across the campus, "a sure-enuf elephant."

George, Alex and Bill stand in line about four feet apart and facing same direction. George falls backward, keeping his body straight and head thrown back. Alex prevents George from seeing new constellations by grasping him at the back of the neck and letting him slowly to the ground. Alex now falls backward and Bill plays the hero. Bill now picks up Alex (Alex keeping his body straight), and Alex repeats with George.

We are not through with this stunt yet. George and Alex spread their legs and place their left hands between same. Alex grasps George's left hand

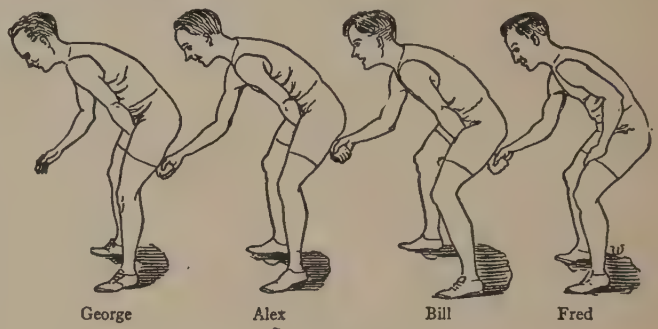


FIGURE 2.—THE CHINESE SNAKE

with his right and Bill grasps Alex's left hand with his right (see Figure 2). Bill now lets himself slowly to Mother Earth until he is flat on his back, legs together. Alex and George walk backward over Bill, and Alex lets himself to the ground. George walks backward over Alex, and lets himself to the ground also. Mind you, they are still holding hands. George gets up and walking over Alex and Bill (legs spread, of course), pulls Alex to his feet, who in turn pulls Bill to his pedal extremities.

Don't dare to let go of hands. George performs a forward roll to the ground and lies there with feet spread. Alex does the same thing, placing his head between George's legs, and Bill repeats between Alex's legs. The trio are stretched out on their backs on the grass. Bill now describes a backward roll over Alex to his feet, Alex helping him by pulling Bill's hand. Alex also performs a backward roll to an erect position, and George ditto. It is now time to release hands, for the "Chinese Snake," as this trick is called, is finished.

Bill locks his hands in back of his neck and Alex and George hang on Bill's arms, locking hands—one on each side. As Bill starts turning around, Alex and George take their feet off the ground, and as Bill turns faster Alex and George become almost parallel with the ground. A very spectacular stunt, but it's easy. Two fellows can do this, the smallest boy locking hands in back of the other's neck.

George lies flat on his back, hands and feet in the air. Alex, standing in back of George, grasps George's hands and pulls him to his feet, George

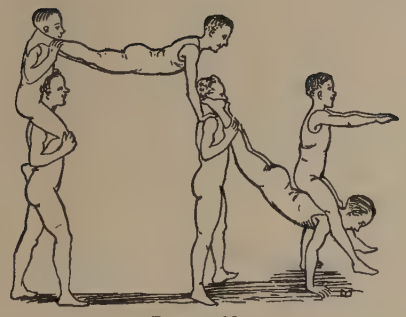


FIGURE 10

a grand flop with little or no danger. To avoid a ride in the ambulance, simply straighten forward from the knees, hold your breath, and hope for the best.

Figure 10 does not require much of an explanation and may be well called "the Elephant," in that when formed the pyramid can move forward. The bottom men should keep in step so as to avoid an anatomical disarrangement of the various parts with consequent results. In breaking this pyramid, the top mounter on the "hind legs" of the elephant will release first one leg of the human span, otherwise he might damage his knees.

Figure 11 is quite simple, yet presents a good appearance. It is self-explanatory, and a crowd of boys who never built pyramids before will find it easy. To make the human arches, bring up one foot at a time and press a little forward to prevent a collapse. In dismounting, release one foot at a time as you lower your arms.

Last but not least is Figure 12, probably the most difficult of the group. An extra man can help the top mounter to climb to his position. The top mounter should stand in the middle of the shoulders and not on the necks of the boys below.

Any wide-awake group can originate many different simple combinations without necessarily advancing into more difficult stages. In addition, numerous effective groupings can be made upon tables, chairs, parallel bars, and other gymnastic apparatus, or by the use of guns, wands, or long poles, flags, and combinations of any of the above articles.

But take the easy ones first; the higher the pyramid the harder the fall.

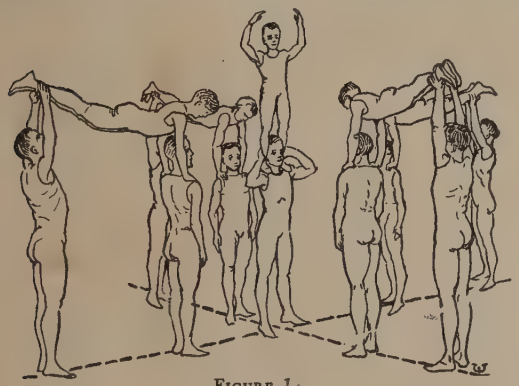


FIGURE 11

FIGURE 12

WHAT TO DO WITH A CLIMBING-ROPE*

No piece of gymnastic apparatus affords more fun or better exercise than the climbing-rope; but to acquire the necessary strength to do the exercises with ease and grace, a boy must be patient and must practise constantly.

These facts should be kept in mind: (1) The rope should be large enough to permit a good grasp. (2) It should reach nearly to the ground or floor. Twenty-five feet is a good length. (3) It must be strong, and firmly attached to the limb of a tree, or, if indoors, to a beam. Watch closely for signs of wear at the point of attachment. (4) Your hands should be perfectly dry. If necessary, use magnesia or a little rosin on them. (5) Never slide down quickly. It will burn your hands.

After the simpler and more fundamental exercises have been mastered—such as jumping for height, jumping for distance, catching the swinging rope, swinging with a half-turn and with a full turn—you are ready to undertake the more difficult exercises and tricks.

Figure 1

(1) *Climbing, using arms and legs.*—Grasp the rope as high as you can reach. Place one leg, as in Figure 1, so that the outside of the foot and the inside of the knee will press against the rope. Pull up and cross the other leg over in front, so that the rope is firmly held between the feet and the legs. (Figure 2.) Relax the legs slightly, raise the knees, and take a fresh leghold. (Figure 3.) Raise the body by pulling up with the arms and straightening the legs. Continue to ascend by alternately raising the knees, taking a fresh leghold, straightening the legs, and pulling up and taking a higher hold with the arms. The leghold is fundamental in all rope exercises, and you must practise it faithfully until you have acquired a strong hold.

Figure 2

(2) *Climbing, using arms only.*—The start can be made from a standing position, although in contests of speed the contestants start from a sitting position. Begin by taking a small reach, one hand over the other with bent arms. As your strength increases, you can lengthen your reach. Alternately raising the legs will help somewhat in lifting the body. Not only the arms, but the muscles of the whole body are brought into play in this method of climbing. (Figure 4.) As a preliminary exercise, use both legs and arms in ascending, and arms alone in descending.

Figure 3

Figure 4

(3) *Looping the rope.*—This is one of the more difficult tricks, but it is a good one to know; not many boys can do it. You can master it only by persistent practice after sufficient strength has come to you. Climb until you are at least eight feet above the ground, hang by both arms, and place the outside of your right foot against the rope. With the other foot lift or pull up the loose rope. Quickly reach down with your left hand and grasp the rope below. (Figure 5.) Hold the two parts of the loop together, and you can sit or stand at ease, as shown in Figure 6. Your hand-grasp must be strong, to enable you to do it. If the loop is made high up, you can take up enough slack to wind round the body, and thus make a doubly secure seat.

Figure 5

Figure 6

(4) *Descending with arm fr[illegible] carrying an object.*—Suppose that your life depended upon descending a rope, and that at the same time one of your arms was injured and useless, or you must carry a child or some other precious object. How would you descend? Begin to practise in this way: Climb halfway up the rope, hold tightly with your legs and one arm, and have someone else throw you an object of small weight that you can catch with your free arm. (Figure 7.) Relax your leg-

Figure 7

* By courtesy of *The Youth's Companion.*

hold slightly, and lower yourself slowly with your arm until it is straight. Tighten your leghold, and take a fresh hand-grasp lower down. Repeat the process as you descend slowly. You must make the change to the lower grasp very quickly each time.

STRENGTH EXERCISES FOR TWO

BY WILLIAM J. CROMIE

Sketches by the Originator of Dual Exercises

ALBERT D. WEGENER

ANTAGONISTIC exercise or companion work is ideal for the growing boy, especially if all the muscles of the body are employed. It is best to work the extremities, the arms and legs first, then the neck, and last of all the trunk of the body, as this exercises the large muscular groups.

The dual strength tests shown in the illustrations should be made with a boy your own height and weight. These will not only prove amusing and

-1-

-2-

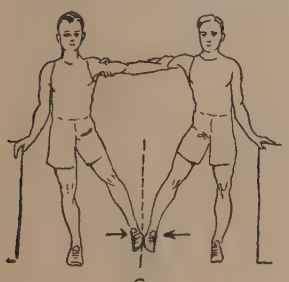
-3-

interesting, but also beneficial, as they will increase the strength of both boys.

-4-

-5-

You will observe, as indicated by the arrow points, that one figure is trying to force the different members of the other figure beyond the median line. For instance, take Figure 1: The median line is vertical (up and down), and the object is to force the opponent's hand past the median line, or starting point, to an oblique position, as in Figure 1. This movement develops the flexor and extensor muscles. This also may be done with the fingers interlocked.



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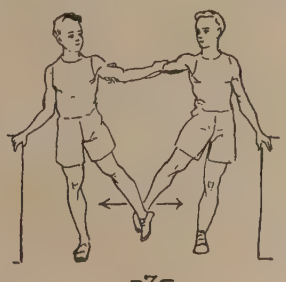

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Figure 2 is a test for the muscles of the upper arm. Place the elbows on the knee, as in the figure, and pull your opponent's hand toward your shoulder. Another way is to push his hand away by straightening your arm. The elbows may be placed on a table instead of the knees. As another strength test with elbows on table, clasp hands and endeavor to force the hand sideward till it touches table. This strengthens the shoulder as well as the arm.

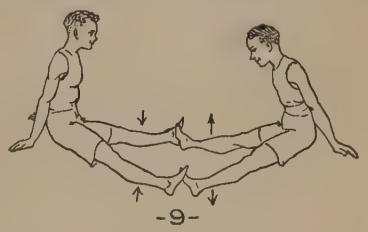

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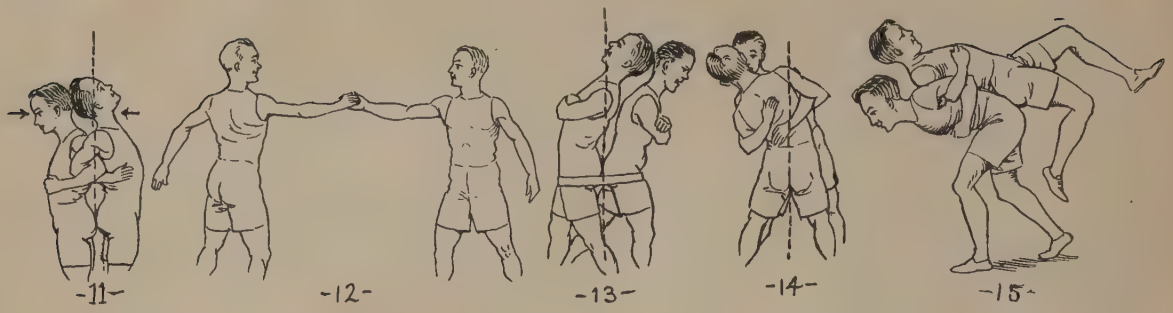
Figure 3 is a foot test. Place the sole of the foot against your opponent's foot and press backward. This is a test performed in the sitting position.

-10-

Leg exercises. In Figures 4 and 5 lie on the chest and use the legs as in figures. In Figure 5 the legs should be tied.

Thigh and leg exercises. Figure 6 is a thigh abduction. The effort is to close the other's leg. Figure 7 is a thigh adduction, or a forcing of the leg away from the median line. Stand back to back and pull the leg forward as in Figure 8. Sit on the floor, as in Figure 9, and force legs apart. Reverse the position and try to bring legs together.

Lie on floor, interlock arms close to



shoulders, Figure 10, raise inside leg, interlock heels and endeavor to pull opponent over backward, which will cause him to do a backward roll.

Stand back to back, as in Figure 11, and try to force head backward. This is an exercise for the back of the neck. Place the palm of right hand against your opponent's and try to force his arm toward his left side, as in Figure 12. This is an exercise for the arm and abdomen.

Place a band or belt about the body, as in Figure 13, and push the shoulders backward. This is a back test.

Figure 14 is a test for the side of the body. One attempts to bend the right side while the other tries to bend to the opposite side. In Figure 15, another abdominal test, stand with hips against hips and try to pull opponent off feet. Do not squat.

In all exercises where one arm or leg is used, always use the other in order to develop both sides alike.

THE SINGLESTICK AS AN EXERCISE

BY WILLIAM J. CROMIE

Exercise with the singlestick is similar to fencing or broadsword work. History reveals the fact that the sword was first used by the early Greeks and Romans. The stick or club has been used to overcome the enemy and wild beasts since the beginning of man. Even to-day the club is used in all our cities by the policeman.

It is not only necessary that a boy or young man be adept in the use of his fists, but one should also know how to wrestle, how to strike an effective blow, and also how to ward off the blow of an opponent. He should know the grappling holds which will put a foe on his back and also the successful breaks to all holds.

A stick, club, cane, or umbrella is an effective weapon in the hand of an expert. One should know how to guard his person from attack and also how to disarm another.

The different guards and "cuts" should be practiced till they are used subconsciously. Practice alternate head guard and head cut ("A" and "B" in Figure 1), till proficient. When this is learned, practice the guard and cut for the right side of the face, the right and left side of the thigh and then the upper cut, as outlined in the six illustrations.

The writer sincerely hopes that these short lessons in boxing, wrestling, and singlestick will prove an incentive to the normal youth to delve further in the mysteries of self-defense. It will not alone give him the physical qualities acquired in these manly sports, but will also give him the confidence of his ability in handling himself under trying circumstances.

Figure 1.—On guard position, both knees slightly bent, left arm across back. Right arm bent about as in "B," Figure 2, stick pointed at head of opponent. This is the starting position for all six figures.

In Figure 1, "A" strikes at the head of "B" and "B" blocks the stroke by quickly raising the stick in a horizontal position above the head. "A" has performed a head cut and "B" a head guard. Practice this till both have it well mastered, then "B" strike and "A" guard. When this is learned, alternate the movement.

The stick describes a circle in the vertical position (see line and arrow). Hold the stick firmly.

Figure 2.—A right face cut and guard. "A" describes a circle in the horizontal plane to the right. "A" should keep the hand close to the head in this stroke. "B" raises the stick in a vertical position. "B" holds the stick about a foot from the face and a little to the front.

Figure 3.—"A" endeavors to strike the left side

Posed under the direction of Wm. J. Cromie

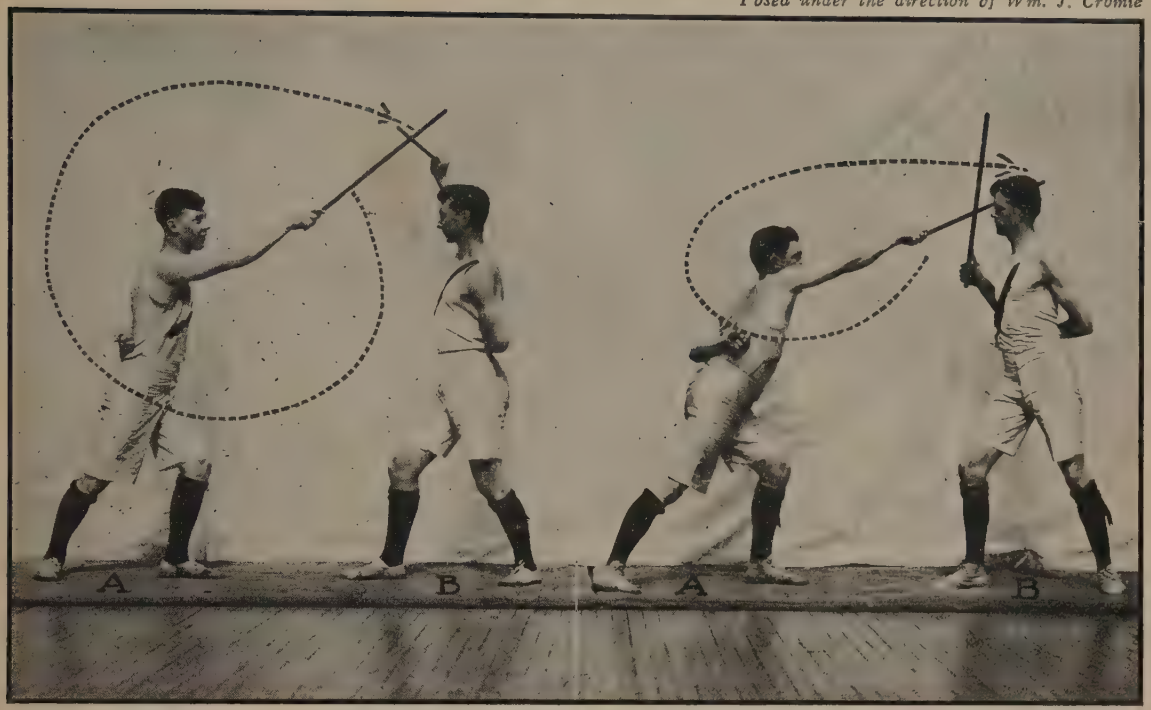


FIGURE 1 FIGURE 2

of "B's" face. "B" blocks the left face cut by raising the right hand above the head with the stick pointing obliquely downward. "A" describes a circle to the left in the horizontal plane. Keep the hand close to the head in this stroke.

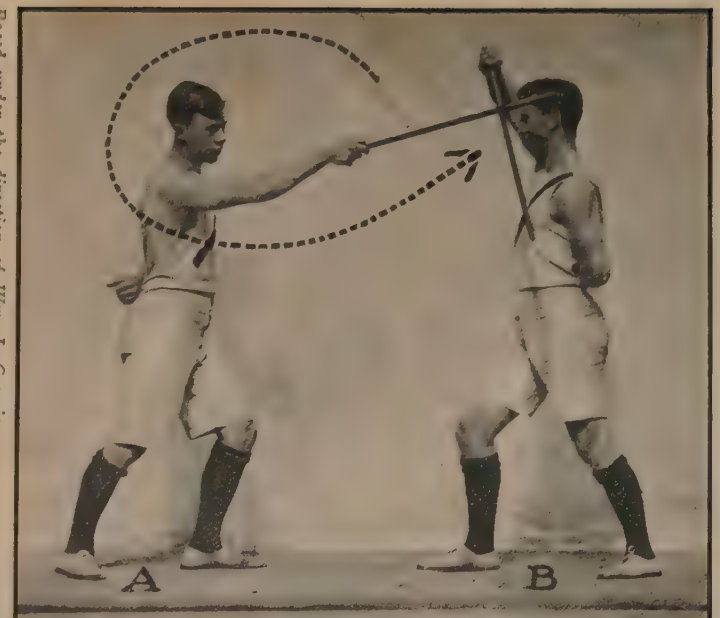
Figure 4.—A right thigh cut and guard. "A" describes a circle to the right in the horizontal plane and then strikes obliquely downward, as in illustration. "B" protects the right thigh by pronation of the forearm (turn the arm outward). In the cut, keep the hand close to the head in describing the circle to the right.

Figure 5.—A left thigh cut and guard. "A" describes a circle to the left in the horizontal plane and then strikes obliquely downward as in figure. "B" protects his left thigh by bringing the right arm across the chest (turn palm of hand upward). Keep the hand close to the head while doing the circle.

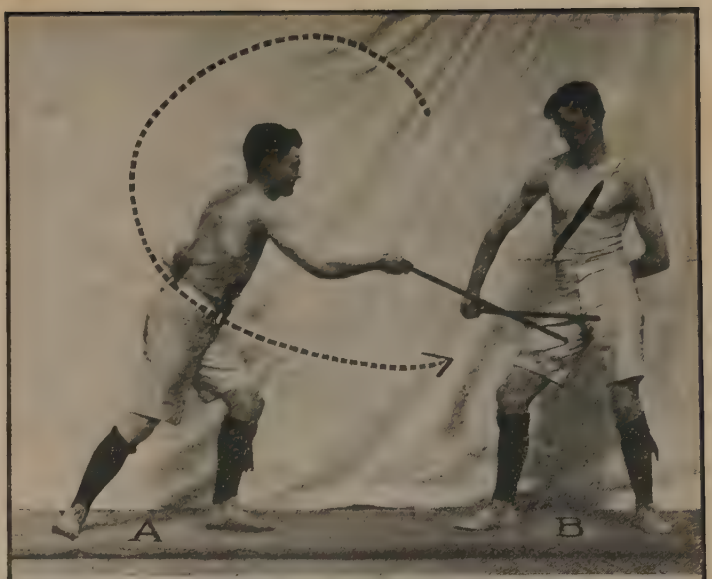
Figure 6.—An upper cut. "A" describes a backward circle in the vertical position. See line and arrow in figure. "B" guards against the blow by holding the stick in a horizontal position at arm's length about one foot away from the body.

When all of the movements in the six figures are mastered, a novel exhibition may be given by alternating all six movements in rapid succession. Example: "A" head cut, "B" head cut, "A" right face cut, "B" right face cut, "A" left face cut, "B" left face cut, "A" right thigh cut, "B" right thigh cut, "A" left thigh cut, "B" left thigh cut, "A" upper cut, "B" upper cut. As soon as this is done, "B" starts with the head cut and then alternates throughout the series.

Singlestick illustrations similar to the six in this article were used in the "Spalding Library," *The American Boy* magazine, and in Wm. J. Cromie's "Three Hundred and Twenty-five Group Contests for the Army, Navy, and School," published by the Macmillan Company. It is through the courtesy of these publications that these photographs are reproduced.



Above—FIGURE 3. *Below*—FIGURE 4



Above—FIGURE 5. *Below*—FIGURE 6

THE HOME GYMNAST ENTERTAINS

BY WILLIAM J. CROMIE

EVERY normal man looks backward across the years in fond remembrance to those happy days when, as a boy, he could perform some athletic "stunt" which proclaimed him a hero among his fellows. The boy of to-day is just the same as his father; he delights in being considered a leader. A normal boy will attempt hazardous stunts rather than be outdone by a "leader." Every boy should practise exercises which require dexterity and a high degree of co-ordination; first, in order to overcome obstacles in connection with these movements, and again, that he may entertain those with whom he comes in contact in social and other gatherings.

Posed under the direction of Wm. J. Cromie

Top—FIGURE 1. *Center*—FIGURE 2. *Lower*—FIGURE 3

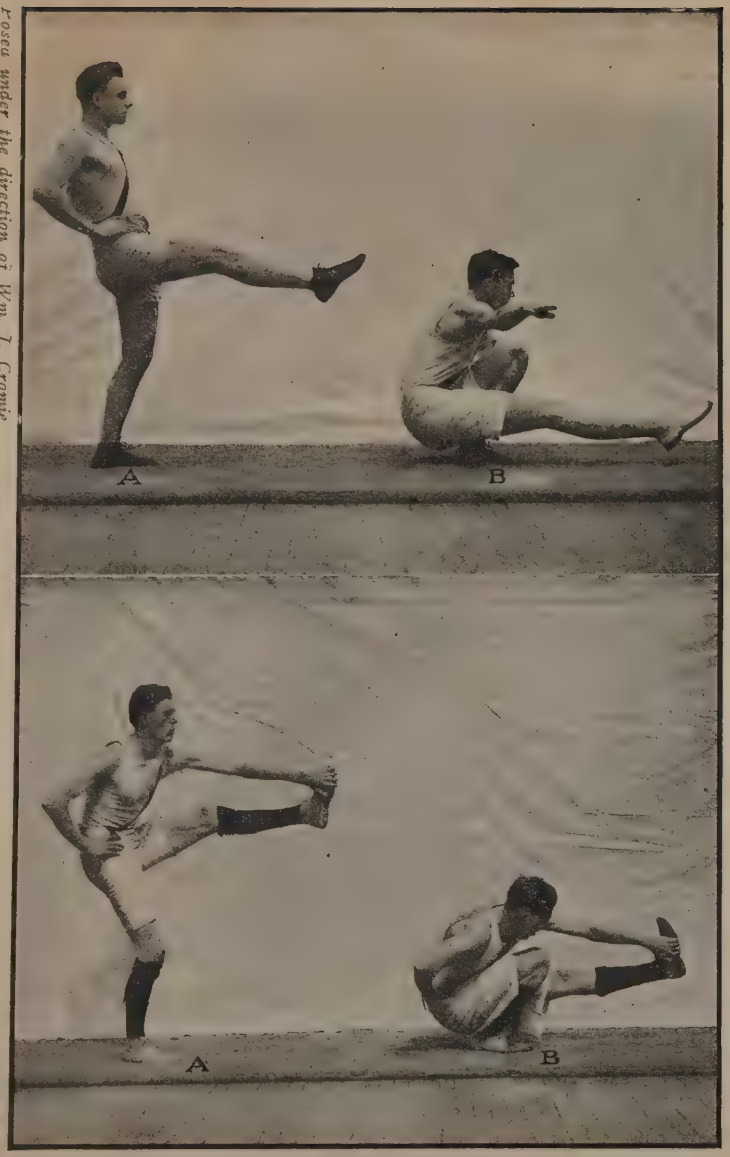
The accompanying illustrations are exercises which require such qualities as strength, agility, co-ordination, skill, and perseverance. A boy who can do these exercises at the first trial is above the average in ability. Any normal youth may with practice become master of this series of exercises.

Figure 1.—Forward bend. Almost anyone not too fleshy can bend forward and touch the floor with the fingertips by keeping knees straight, but it is quite difficult to touch the floor with the palm of the hands. From "A," bend forward, touch the floor as in "B," keeping the knees stiff. This can only be accomplished by persistent practice.

Figure 2.—The crawl. Crawl on hands and knees and, with the right knee on the floor, reach right arm forward and extend the left leg backward, as in position "A." Travel forward by bringing left knee forward as far as possible, left arm forward, extending right leg backward, as in "B."

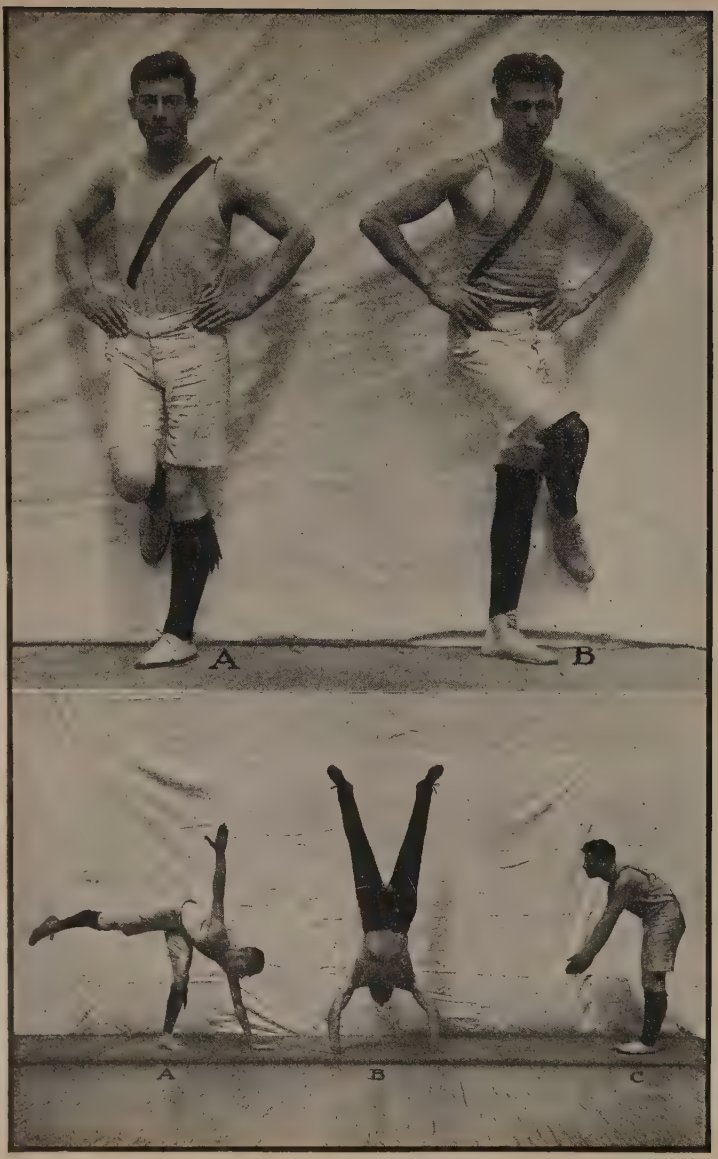
Figure 3.—The crawler. Lie on right side, right arm and right leg on the floor, as in "A." Bring left leg up to center of body as in position "A," then turn to other side of body as in position "B." Move forward by straightening the top arm and leg and by turning onto the opposite side.

Figure 4.—Sink to floor with extended leg. Figures 4, 5, and 6 are a progression of the same form of exercises and require a good balance.

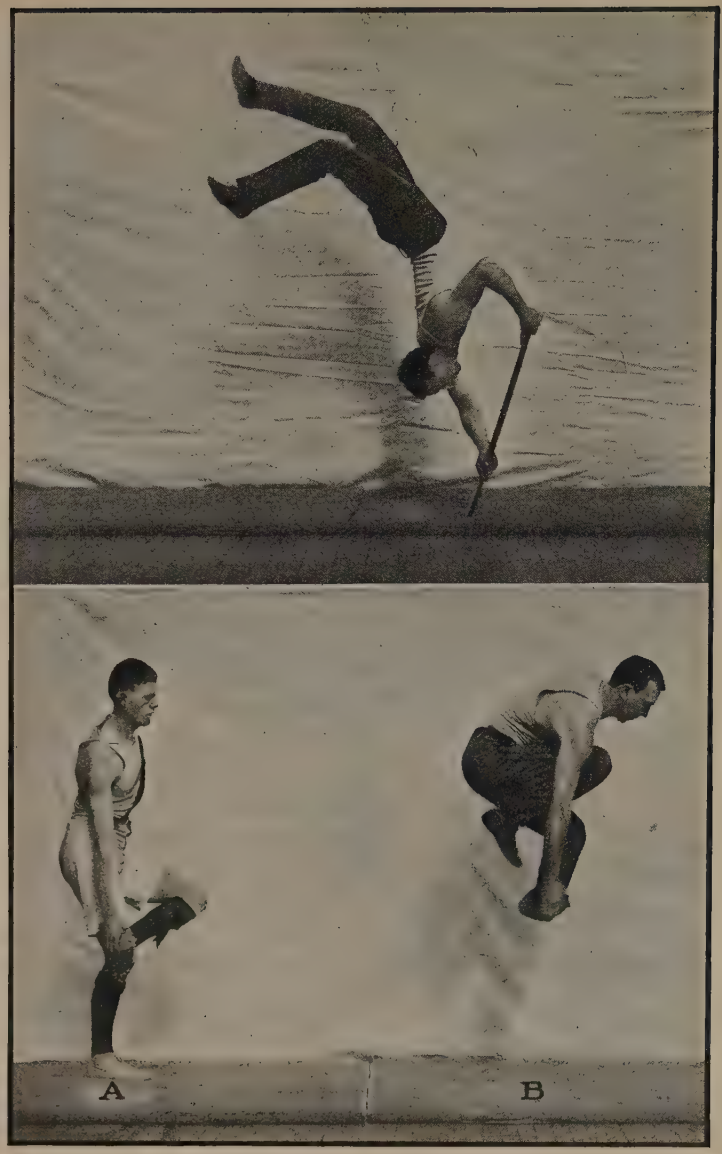


Upper—FIGURE 4. *Lower*—FIGURE 5

Upper—FIGURE 6. *Lower*—FIGURE 7

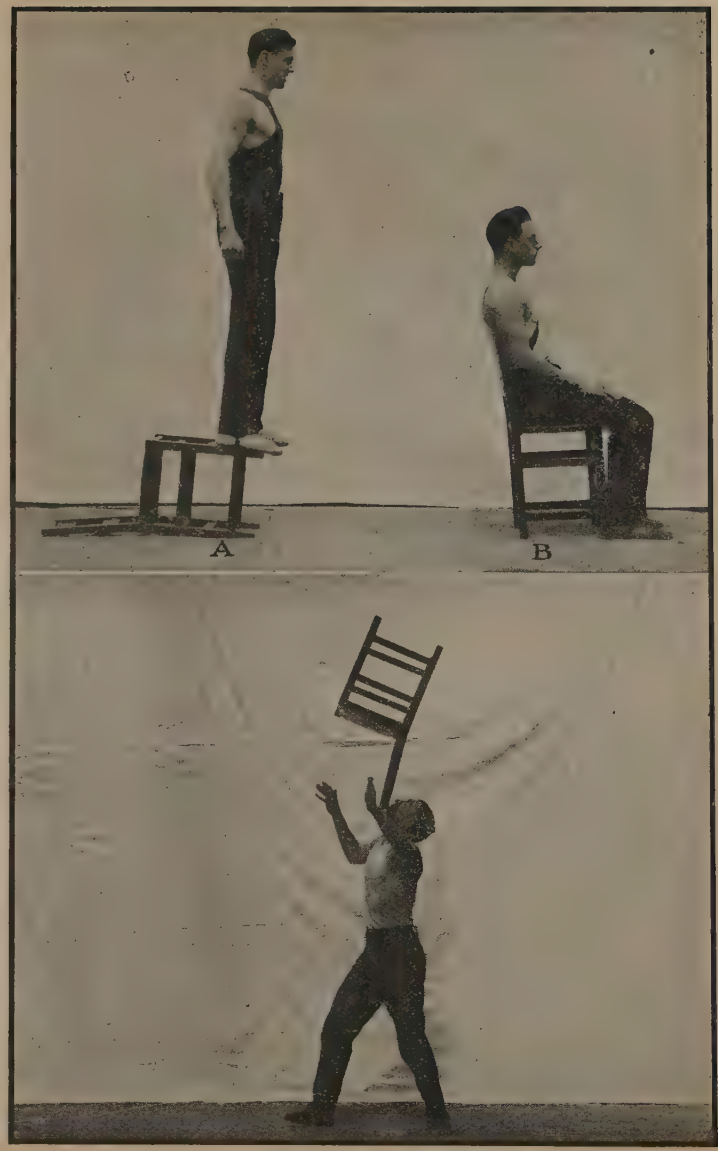


Upper—FIGURE 8. *Lower*—FIGURE 9



Upper—FIGURE 10. *Lower*—FIGURE 11

Upper—FIGURE 12. *Lower*—FIGURE 13



Upper—FIGURE 14. *Lower*—FIGURE. 15

From "A" position, right leg raised, bend the left knee until in "B" position. From this position, rise to the upright position without touching the right foot on the floor. Extend right leg, then use the left.

Figure 5.—Grasp the instep of either foot, extend the leg as in "A," deep-knee bend on the other foot as in "B." Return to starting position. Hold the foot throughout the movement.

Figure 6.—Stand on the left foot, place the right foot in the rear of the left as in "A," and lower the body until it reaches "B" position. Return without touching the floor. The right foot should not touch the floor. This is a very difficult movement.

Figure 7.—Front jump over foot. Place the right foot against the wall as in "A." Jump over right foot and hold the position on right foot as in "B." Return to position "A."

Figure 8.—Rear jump over foot. With back to wall, place right foot against wall and jump over it with left without stepping forward, as in position "A," to position "B." Return from "B" to "A" position.

Figure 9.—Round off. From standing position, place left hand on the floor as in "A", reach out with right hand and place it on floor, and bring feet in the air as in "B." Finish by making a half-left turn of the body as in C.

Figure 10.—Take a wand or broomstick and perform a handspring over it as illustrated. The performer here is just about to release the weight on the wand and is drawing in his feet to land in the upright position.

A boy should be able to perform a handspring well before attempting this feat.

Figure 11.—Jump over foot. Grasp the instep of the left foot with the right hand, as in "A." Hold the instep and bring the right leg up and jump over the left as in position "B." One may return to the starting position by jumping backward, which is quite difficult.

Figure 12.—Push from wall. Stand away from the wall, from two and one-half to three and one-half feet, according to one's height. Place hands against wall, and then the head. Remove the hands, grasp the chair and, keeping all parts of the body from the wall, except the head, come to "B" position.

Figure 13.—Pass leg around chair. Place the hands on the top of a chair and stand with both feet on the lower rung. Move the right leg to the

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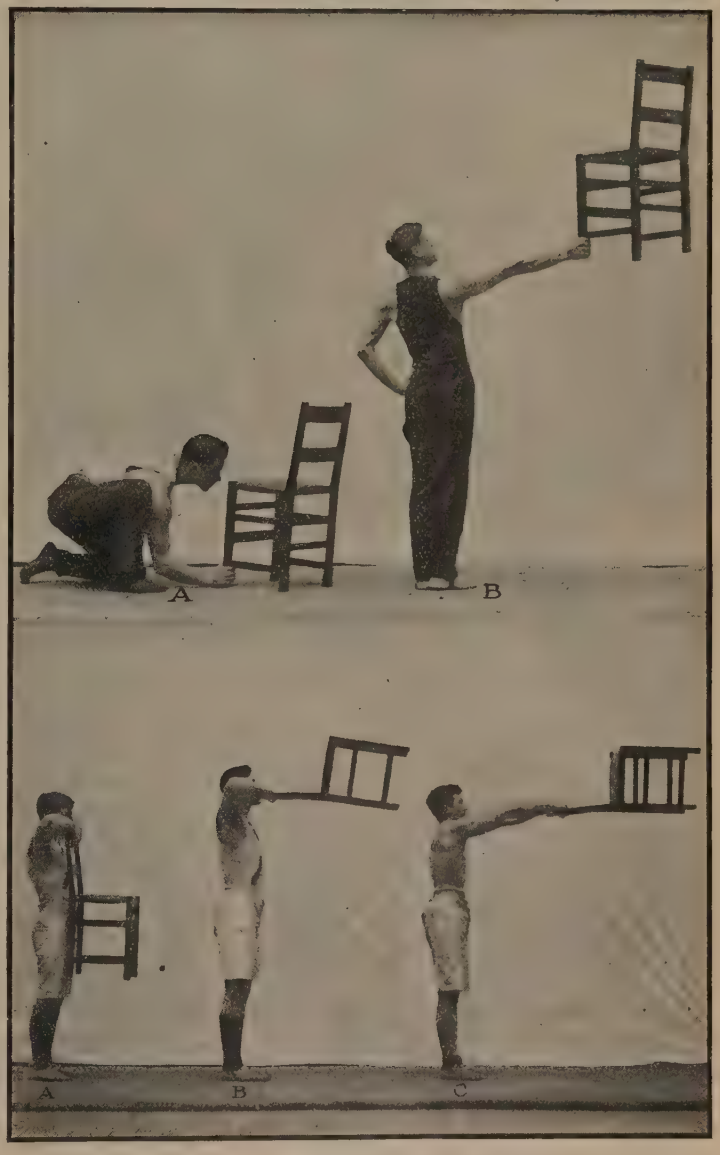

Upper—FIGURE 16. *Lower*—FIGURE 17

left, as in Figure "A," and continue moving in the same direction till leg passes left hand. Now move the right leg to right (position "B"), and pass in front of left leg to starting position. This is performed by distributing the weight of the body as seen in position "B."

Figure 14.—Jump on legs of chair to sitting position. Run and jump on end of chair-legs as in "A." The weight of the body will upturn the chair and the performer sits down quickly as in illustration. In jumping on the chair as in "A," however, one must be near the end in order to bring the chair to upright position. A chair with strong, substantial legs should be used.

Figure 15.—Chair balancing. Place a chair on the chin and balance it. One must be careful in a movement of this sort, as the chair is likely to fall and strike the head. Be always ready to catch the chair if it becomes overbalanced. Practise at first with a light chair.

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Upper: FIGURE 18 *Lower:* FIGURE 19

Figure 16.—Hold chair with one hand. Grasp the bottom of a chair as in position "A." Muscle is out at arm's length as in "B." It is rather difficult to lift and push the chair out by sheer strength. Grasp it as in "A," give a quick pull toward the body, and before it can become overbalanced, quickly extend the arm and rise to position "B."

Figure 17.—Push out chair to arm's length. Grasp the top of a chair. Bring the top of the back so that the chair touches between the lips and chin, as in "A." Slowly press the chair until horizontal, as in position "B." From that position extend the arms as in "C." The object of the movement is to hold the chair in the positions as illustrated.

The most difficult part of this stunt is that of position "B," as it requires a good grip. Start with a light chair, and with practice you will be surprised how easily a heavy chair may be handled in this way.

Figure 18.—The horizontal lever. The front horizontal lever is a good test of one's balance. Grasp the chair with the hands as illustrated in figure. Bring the right elbow in toward the center of the abdomen. Keep the legs stiff, slowly raise them and lean forward with the body. Be careful not to fall forward. At first have someone hold the chair. When this is mastered, extend the left arm, and so perform the lever on the right elbow.

Figure 19.—Head balance. Face the chair, grasp outer sides of chair bottom and rest head on chair six

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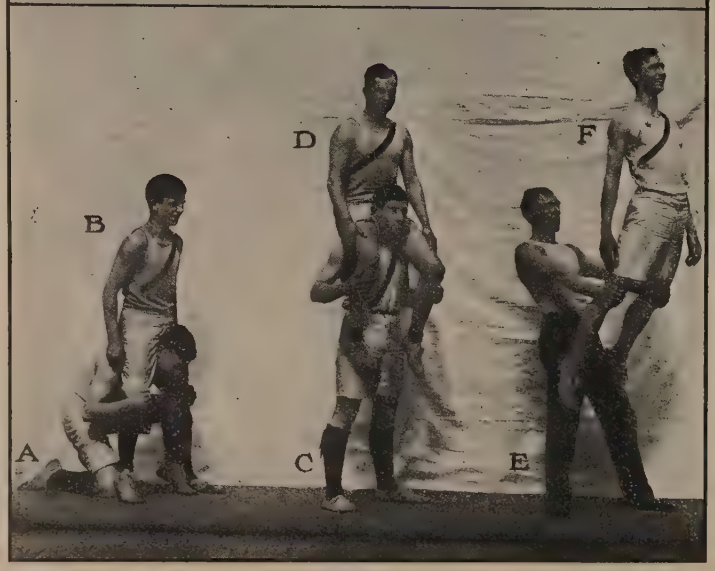

Upper: FIGURE 20 *Lower:* FIGURE 21

FIGURE 24

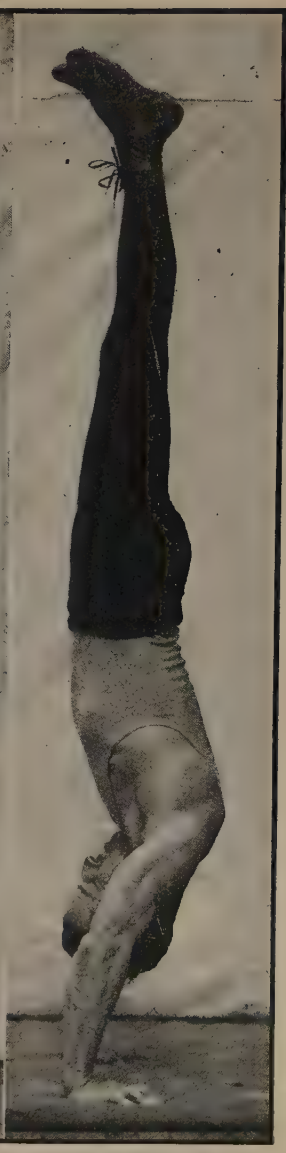

FIGURE 25

or eight inches in advance of hands. Now raise body and legs as in position "A." From this position raise legs up straight as in "B." To dismount, bend at waist and snap feet down to floor. Get assistance during the first trial of the head balance.

Figure 20. Roll from chair. Face front, legs astride chair. Grasp the bottom of the chair's front legs, thumb and forefinger next the floor as in position "A." Roll forward and support the weight of the body upon the hands until the legs are straight on the floor. Roll backward, and when in "B" position snap from the neck and shoulders, push with hands, spread legs, and return to starting position. At first, place pillows on floor to ease the weight of shoulders.

Figure 21.—Two-high, standing on knees. "A" kneels on one knee, placing his head between "B's" legs. He then lifts him as in "C" and "D." From this position, "B" leans backward and straightens up as in "E" and "F." This may also be performed three-high.

In lifting "B," "A" should get the weight of "B's" body on the shoulders and back, and not on the neck.

Figure 22.—Raising another above head. "A" bends forward and interlocks his fingers in the rear of the knees. "B" reaches under left arm, grasping "A's" right, pulling "A" in close to the body' straightening up and pushing "A" to arm's length as in "C" and "D." "A" must retain his grasp throughout.

This is not so difficult as it appears. "B" should pull "A" over toward the left side of his body, before he attempts the push. "A" can assist by jumping at the beginning of the lift. Practice with a boy considerably lighter than yourself.

Fig. 23.—Hand to shoulder balance. "A," the top boy, places his hands on "B's" shoulders and jumps to a stride position with legs open across "B's" abdomen, just above the hips. "B" then leans backward and swings "A" up to a shoulder balance as in figure.

Figures 23, 24 and 25 are stunts of "the first water," require considerable practice, and are worth all the time spent upon them.

Figure 24.—One-arm balance. From the ordinary hand balance, shift the weight to the right (or left) arm, raising the opposite arm as in figure, or hand on chest. This is a difficult movement.

Of course, a boy should master the balance upon both hands before attempting a one-arm balance. First learn to do a head balance on the floor,

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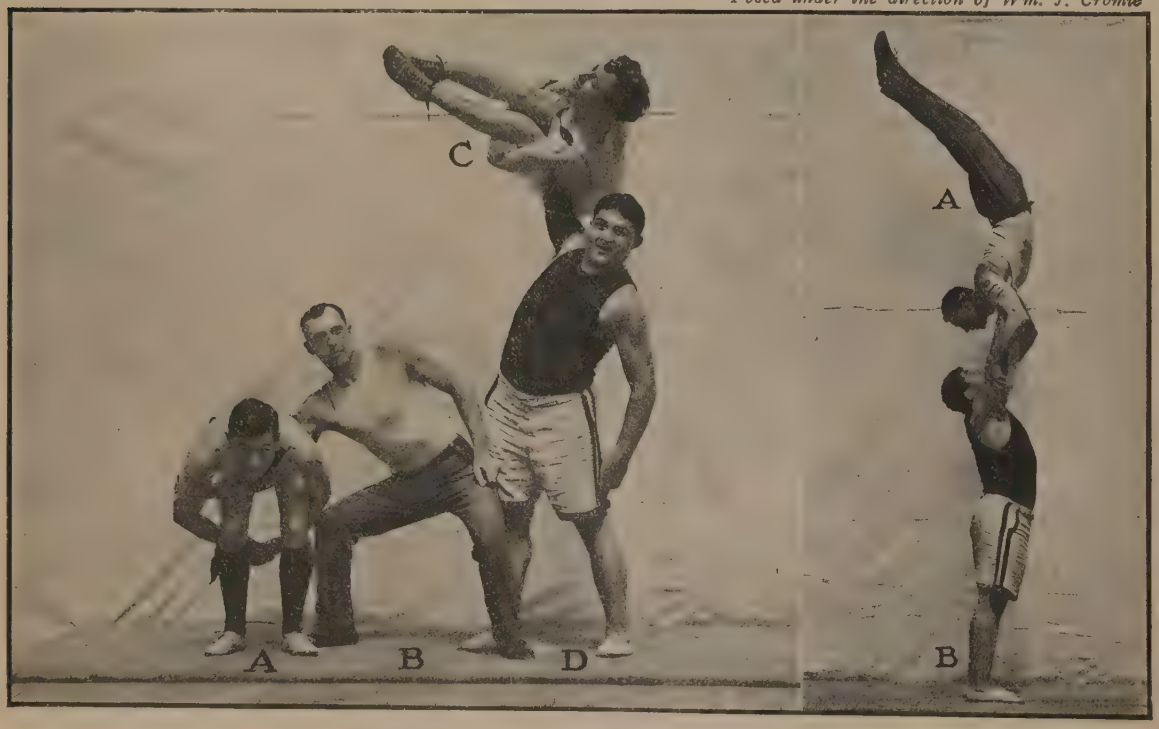


FIGURE 22

FIGURE 23

as explained in Figure 19. After the head balance is acquired, practice the hand balance. Have another boy hold the feet, or face the wall, place both hands upon the floor and swing the feet up against the wall, arms straight and legs straight. After this, practice the one-arm balance.

Figure 25.—Straight hand balance. This is a graduating exercise. A boy who can do this exercise has reason to feel proud. From an ordinary hand balance, bring the head between the hands till the feet can be seen as in Figure 25. Get another to hold the feet at first.

WORK WITH A PUNCHING BAG

BY WILLIAM J. CROMIE

BAG PUNCHING, as an exercise, is easy, simple, beneficial, and safe. It develops all muscles of the body and rewards one with symmetry, grace, agility, endurance, and strength. To become a proficient bag puncher, however, requires time, practice, patience, and perseverance.

Most of the manly sports are more or less dangerous. The devotee of the gridiron is often laid up for repairs with a dislocated shoulder or a broken limb. The track and field athlete must resort to bandages and plasters on account of strains and pulled tendons, while the exponent of the manly art (boxing) is often decorated with a black eye or a swollen nose. The simple calisthenic exercise of bag punching gives one nearly all the benefits derived from the above-named sports, and that without incurring any of their dangerous features.

Experienced knights of the padded mitts find bag punching an ideal form of exercise for keeping in good fighting condition. The arms, shoulders, hands, wrists, and legs are brought into prominent play in this exercise. Punching the bag with the front and back of the head develops the muscles of the neck, back, and abdomen. The chest is broadened and deepened, the shoulders become square and upright, the breathing is quickened, and the circulation of the blood is stimulated through the act of striking the bag. Fifteen or twenty minutes of bag punching acts upon the body about the same as a meal of well-selected food; in fact, to get the most energy from one's food, one must daily indulge in some form of wholesome exercise.

Most of the daily acts of life consist in grasping and clutching, which develop the flexor muscles, while the extensor muscles, those used in striking, are neglected. This is another reason why hitting the leather sphere is beneficial.

In boxing, wrestling, and fencing, a companion or antagonist is always required, while in bag punching it is one alone. There is no exercise, with the possible exception of swimming, which when done alone does not become irksome and monotonous, apart from the fascinating, interesting art of bag punching. I speak from experience, having indulged in most forms of physical exercise for years.

Every youth should learn to strike the bag. Its very appearance, hanging in mid-air, tempts one to let drive at it with all his might. True, it will rebound and he must strike again, and this starts in motion an exercise which will keep all the machinery of his body well lubricated and give him in return large dividends for the expended effort.

When a boy becomes a good puncher of the bag, he should not be selfish in his recreation and physical education, and should teach his sister the fascinating art. Boys and girls should be able to use their fists, in bag punching, to make strong and keep strong their physical organism, and again as a method of self-defense in times of danger.

The punching bag and necessary apparatus is inexpensive when the beneficial results from its use are considered. The disk for the bag may be hung in a cellar, garret, outhouse, or barn.

The method of striking the bag plays an important part in this exercise. Some use gloves, but I prefer the bare fists, as it hardens the hands and gives one a greater variety of blows. The bag should be hung according to one's height, the center of the ball falling a little below the eyes. Practice not more than ten minutes the first day with occasional rests in between. Gradually increase the length of practice, and eventually you will be able to work an hour or more if you do not unduly accelerate your speed. Learn to perform the different blows slowly and accurately. Do not attempt to work too rapidly at first, as you will become inaccurate in striking, the ball will deviate from the place it should go and your style will be faulty. Clench the fists tightly, press the points of the fingers into the palms with the knuckles on a straight line and thumb bent on the fingers. Never strike the bag toward a wall, as you may miss and injure the hand. Keep your eyes trained on the ball just as you would on the eyes of a boxer. Do not perform vigorous bag punching, in fact any kind of strenuous work, immediately after a heavy meal, as it tends to cause indigestion.

Figure 1.—The left lead. Hold the right forearm across the chest, as if to guard from an imaginary blow. Strike out straight from the shoulder. Put the force of the body behind the blow. Step forward with the left foot when the blow is struck and quickly recover. Lead with the right in the same manner, stepping forward with the right foot. Right and left tattoo is fast punching of the bag without stepping with the feet. A tattoo is a continuous rebound of the bag in a uniform rhythm.

Figure 2.—The left hook. The left-hand hook is a blow much used in boxing. Stand with the feet about twelve or fourteen inches apart with the left about six inches in advance of the right. Bend the elbow, raise the left heel and pivot and strike the bag in the center. Use the right hook in the same manner.

Figure 3.—Alternate right and left hook. Raise the arms, elbows bent, and strike the bag with one fist, then the other. At first let the ball rebound once after each blow; later without the rebound, which is more of a tattoo. Keep the feet about fourteen inches apart, head and shoulders well back. This is excellent work for the arms, shoulders, and chest.

Figure 4.—Left uppercut. The uppercut is somewhat similar to the hook. Make a short stroke. Bend the arm as in figure and raise the left heel as the blow is struck, as this helps one to put more force behind the blow. Repeat with the right fist.

Figure 5.—The left elbow. A great variety of blows in fancy bag punching may be used. Stand feet apart and strike the bag with the left elbow, as shown in Figure 5. Practice with one elbow, then the other. Alternate left hook and left elbow; same right. Left elbow and right hook. Right elbow and left hook. Triple punch: left elbow, left hand and right hook. Same on other side. Strike with the back or side of the hand after the elbow stroke. Revolving punch; left elbow, left hand, right hand, right elbow, half left turn; then with left elbow back to bag. Same on other, starting with right hand.

Figure 6.—The head stroke. A number of different blows may be used by using the head. Make a left and right lead, and on the next rebound strike the bag with the forehead. Stand under the bag and strike it alternately with the fore and back of the head, as in figure. It may also be struck by the sides of the head.

Posed under the direction of Wm. J. Cromie

FIGURE 1

FIGURE 2

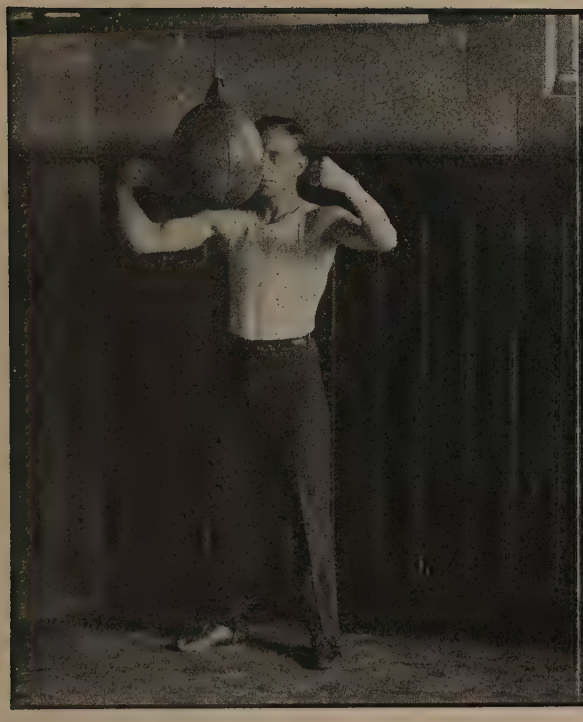


FIGURE 3

FIGURE 4

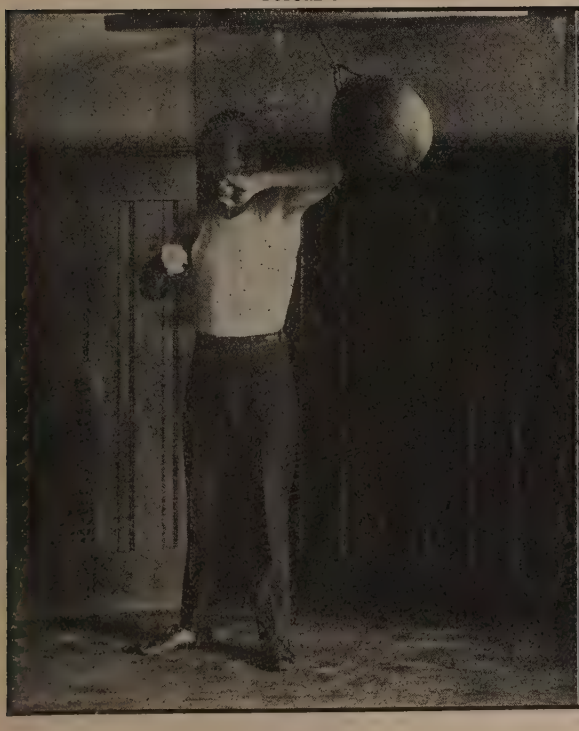


FIGURE 5

FIGURE 6

Posed under the direction of Wm. J. Cronite

Top—FIGURE 1. *Center*—FIGURE 2. *Lower*—FIGURE 3

Top—FIGURE 4. *Center*—FIGURE 5. *Lower*—FIGURE 6

Posed under the direction of Wm. J. Cromie

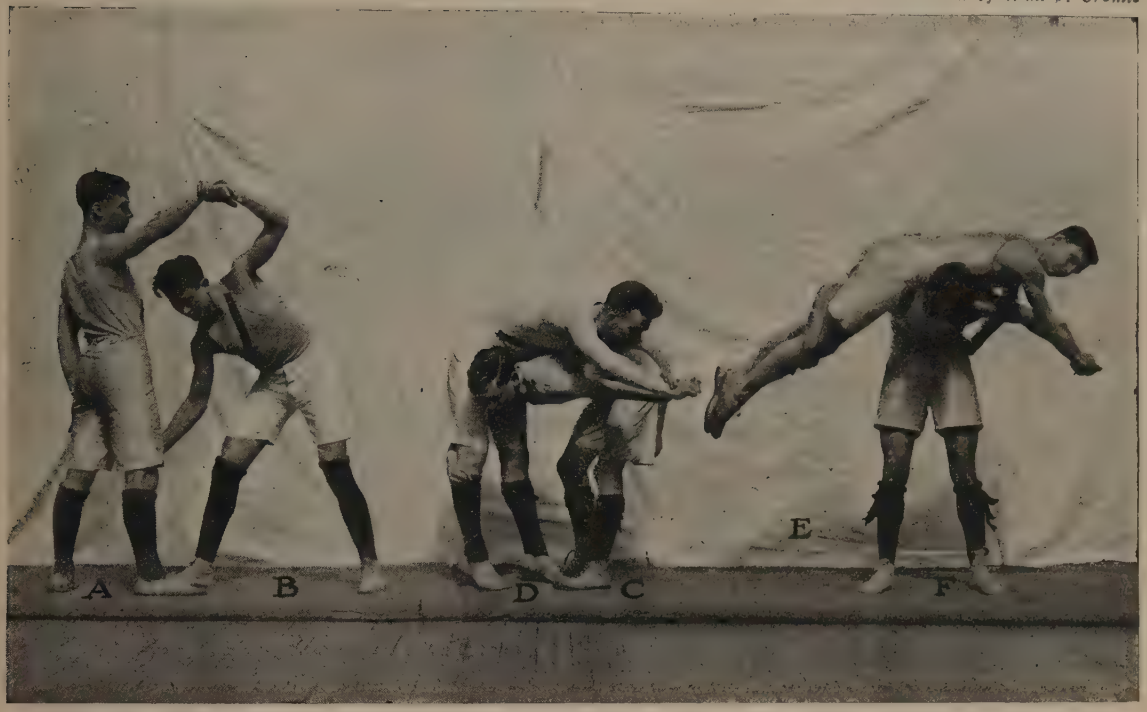


FIGURE 7

SELF-DEFENSE

BY WILLIAM J. CROMIE

HAND-TO-HAND fighting, or self-defense, was a perfected art in Egypt three thousand years before the birth of Christ. Not far from the banks of the Nile, in the temple tombs of Beni Hasan, hand-to-hand fighters are depicted in almost every position in use to-day. Wrestling was one of the five events called the pentathlon in the ancient Olympic Games. While it was a friendly contest in these countries, yet it was ever a preparation for a more enduring soldiery. It is just as important to-day in warfare; in fact, in the recent world war, hand-to-hand fighting, or "death grapple," was taught the soldiers. Many a soldier's life was saved in No Man's Land on account of his ability to use this art when attacked by the enemy.

Hand-to-hand grappling calls for as great strength, endurance, agility, and combined cool judgment as any known sport. For youth its attractiveness and value need no comment. There is, however, a prejudice against wrestling among many who mistakenly regard it as too violent and dangerous. At times it may be a little rough, but so is life. In beginning, care must be taken against violence and over-exertion. A wrestler must creep before he can walk; the muscles must be gradually strengthened and habituated to perform their duty.

The exercises here shown are not bona fide wrestling, but rather movements of self-defense. Care should be taken in the indulgence of the jujutsu or strangle holds in friendly competition. These exercises when performed on an enemy are brutal, and should only be used in trying circumstances. Every boy and young man, however, should know their danger and value, and be able to apply them, if necessary.

Exercise 1.—The illustration of self-defense in Figure 1 shows the method of rendering an antagonist's arms helpless through attack. Quickly grasp the coat of the antagonist by a quick pull opening the buttons, as in "A" and "B." From this position push the coat backward and downward, as in "C" and "D." Grasp both sides of the coat with one hand, and the opponent is then helpless, as in "E" and "F."

Exercise 2.—"A," with his right hand, grasps "B's" right hand, as in Figure 2, and makes a quick turn of the body to the right and secures a hold, as in "C" and "D." "D" is rendered helpless, as a little pressure on the wrist would break his arm. This of course should never be used except in extreme measures. This is a jujutsu exercise.

Exercise 3.—"A," with his right hand, grasps the back of "B's" left hand, as in Figure 3, and turns so that he is in the rear of "B" and under the arm, as in "C" and "D." From this position he presses and lifts on "B's" hand and renders "B" helpless, as in "E." The bending of the wrist, as in this illustration, is a movement much used in jujutsu.

Exercise 4.—The hold in Figure 4 is known as "The Flying Mare." "B" grasps "A's" left hand with both hands, makes a half turn of the body, as in "C" and "D," pulls on "A's" arm, and raises him, as in "E" and "F." The continuation of this movement is a fall from the position of "E" and "F," by pulling on the top man's arms, landing him on the floor.

Exercise 5.—The next movement, Figure 5, is a strangle hold. "B," with his left hand, grasps "A's" right hand and places his left hand back of "A's" neck, gives a quick pull, forcing "A's" head under his left arm, as in "C" and "D." He then places his left hand on the right shoulder of "A," and grasps the left hand with his right, which completes the strangle. "A" is now helpless. If he endeavors to rise, he tightens this strangle hold, nor can he use either hand.

Exercise 6.—Figure 6 is called "The Cross Buttock." "A" grasps "B's" left hand with both of his hands, places the left leg in the rear of "B," as in "C" and "D," and then pulls, with the resultant fall, as in "E" and "F."

Exercise 7.—Figure 7, in wrestling, is called a wrist and crotch hold. "B," with his left hand, grasps "A's" right hand, passing his own right hand between the legs and around the right leg of "A." "B" then bends forward, pulling "A" down as in "C" and "D," and rises, as in "E" and "F." "B," lowering the head, can dash "A" to the floor.

BOXING AS AN EXERCISE

BY WILLIAM J. CROMIE

FROM the earliest history, self-defense in the form of boxing has appealed to boys and young men. This subject is so large it would require a book to properly treat it, so the writer has endeavored to place in the hands of the youth a few typical illustrations in the art of self-defense.

So much discussion of a derogatory nature has been given boxing that it is enveloped in a mystical cloud, especially among the better class of people. It is, therefore, called dangerous, brutal, and degenerating. This state of affairs is due to the fact that most people do not know the difference between the art of self-defense and prize fighting. There is practically nothing that can be said against this sport when it is considered in the light of a pastime, and as a means of beneficial exercise.

Every boy should learn to box, and if he does not, he is apt to become a mollycoddle. A scrapping boy is better than one who "flunks" a fight, because non-resistance under some provocations is unmanly, craven, and cowardly.

If every boy who is a lover of clean sport and fair play will foster, uphold, and protect the art of boxing, it has indeed a rosy future. The game of boxing is a thing to conjure by, even by Presidents, one of whom said, "My hat is in the ring," and another once remarked, "My head is in the ring."

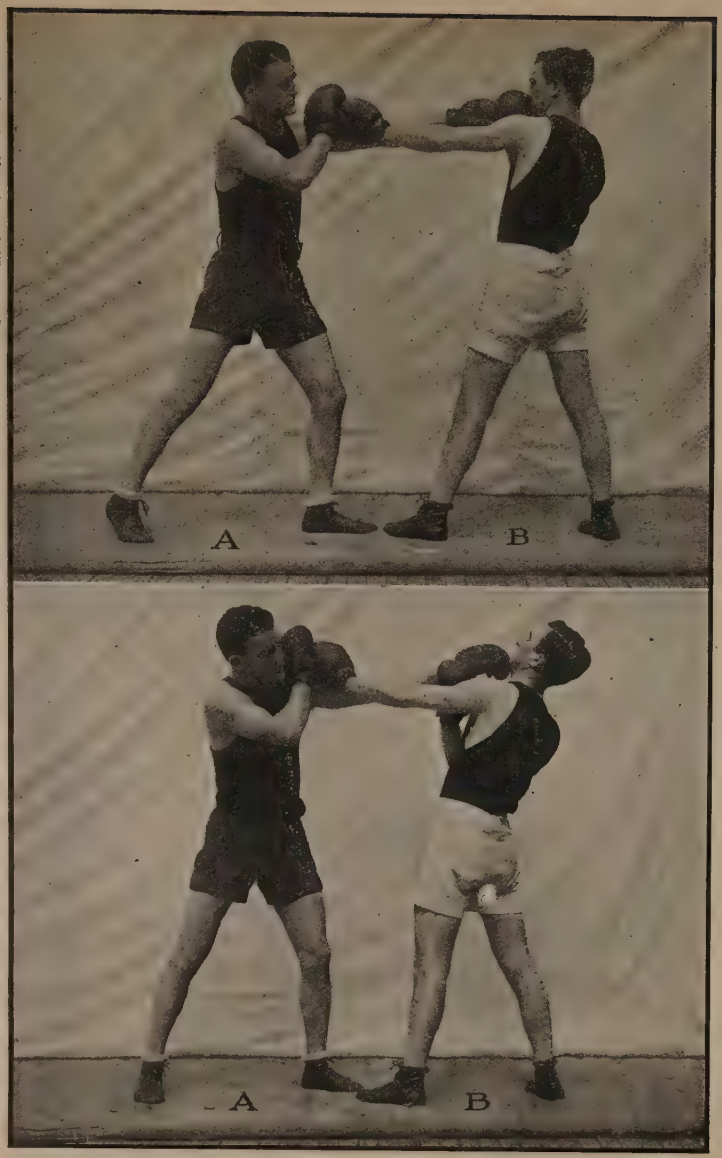
Let every boy, then, follow the example of the soldiers in the cantonment by indulging in this exercise, which develops qualities such as self-control, judgment, agility, force of will, courage, and endurance.

It, if indulged in rightly, teaches a boy the principles of honest, educated fighting, so that he may, with the Apostle Paul, say: "So fight I, not as one that beateth the air." It also teaches the value of the fighting edge, not only of the physical, but also of the mental, social, and moral.

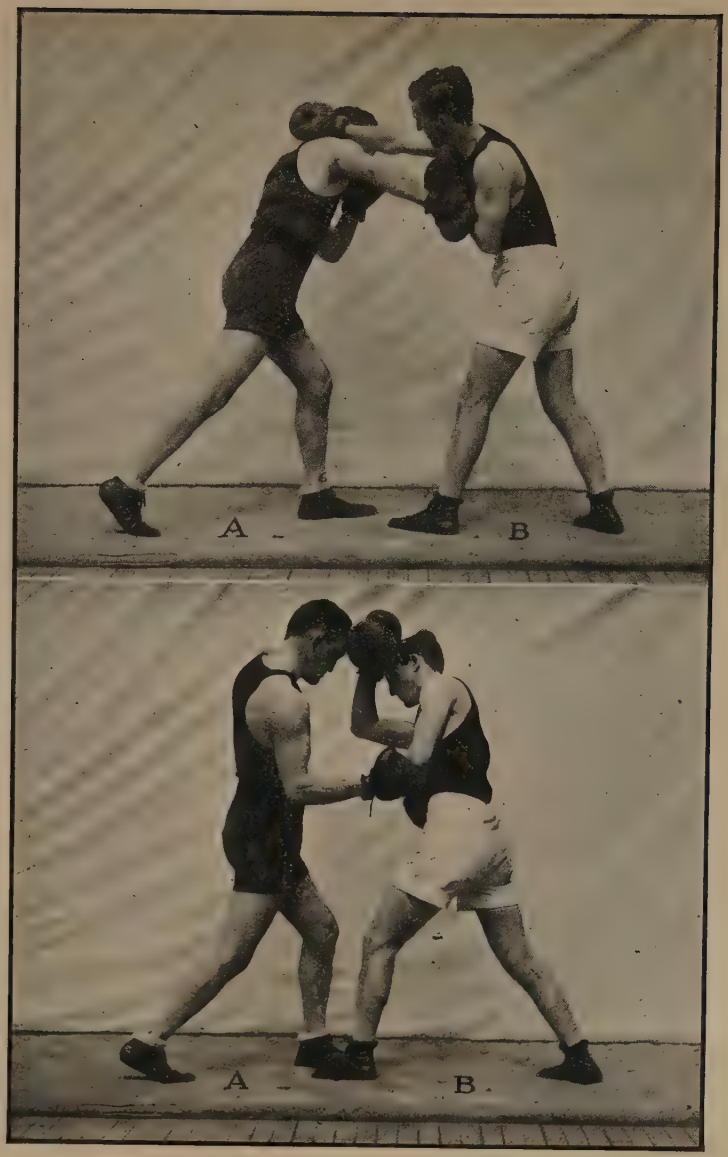
In the first illustration in this series, Figure 1, "A" and "B" are leading with the left, and blocking with the right. The "block" is made in front of the face, as in the figure.

In Figure 2, "A" is leading or striking with the left hand. In boxing, this is known as a left jab. "B" has failed to properly guard his face, and "A," as can be seen, has landed with the left on his chin, at the same time blocking "B's" left-hand lead with his right.

In Figure 3, "A" and "B" are both well covered. "B" is striking with his right hand, and "A" with his left hand. Both punches are blocked. "A" has ducked a lead to the face. This punch is



Upper—FIGURE 1. *Lower*—FIGURE 2



Upper—FIGURE 3. *Lower*—FIGURE 4

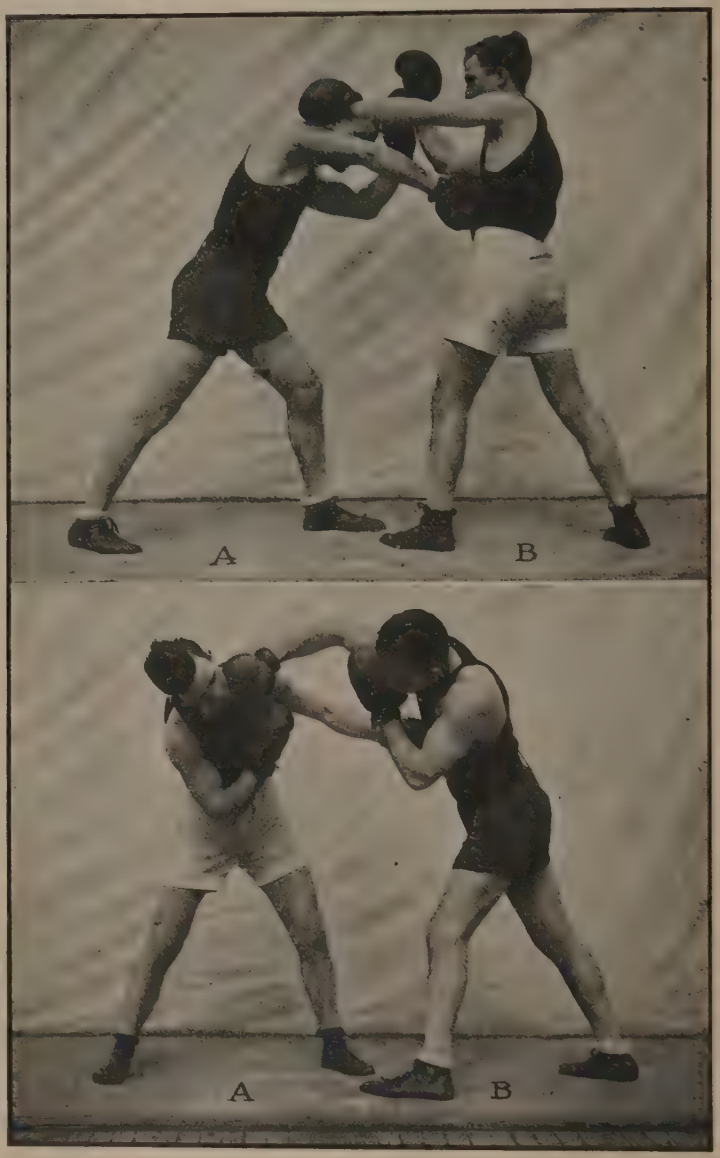
known in boxing parlance as a "right-hand cross."

In Figure 4, "A" is delivering a right-hand body punch, which is well covered by "B."

In Figure 5, "A" has delivered a right-hand body punch, and at the same time has made "B" miss his left-hand jab.

In Figure 6, "B" is in the act of delivering a knockout punch. "A" has failed to block it, as his right hand is too low to protect his jaw.

Posed under the direction of Wm. J. Cromie



Upper—FIGURE 5. *Lower*—FIGURE 6

WRESTLING

BY WILLIAM J. CROMIE

THE FORM of wrestling known as catch-as-catch-can is as old as the race itself. It is the most popular style known today, and includes every hold, trip, or throw which is found in other systems, except those which require special clothing or apparatus.

It would require a large book to treat thoroughly the subject of catch-as-catch-can wrestling. The novice will, however, find the groundwork in the accompanying cuts, the practice of which, together with those which will come to him through training, will make him quite proficient in this interesting and healthful sport.

There are a few rules in wrestling which it is well to observe. One should always endeavor to have an opponent about one's own weight. More is gained in wrestling by being aggressive than by being on the defensive.

The best time to throw a person is when he is moving or exerting his strength in the same direction as that in which you desire to throw him. Of course, strength is required in wrestling, but strategy plays almost as important a part. If a hold is checked or is ineffective, then one should quickly change to another. Always guard the position of the head, arms, and legs, because where one of these members is forced to go, the body is bound to follow. Try, when possible, to keep the elbows close to the sides of the body and the legs together. When on the mat, always keep in motion and thus frustrate the plans of your opponent; at the same time try to get an effective hold on him. When a hold is attempted upon the neck, keep it in close to the shoulders and so shorten the leverage. When possible, keep your aggressor pinned down by your weight, as this not only prevents him from changing his position, but also wears out his strength.

A fall in wrestling is obtained only when both shoulders of either person are on the mat at the same time. The opposite side of the body may be attacked in all of the illustrations where a side hold is shown.

[Credit is here given to the four members of the University of Pennsylvania wrestling team, two of whom are Intercollegiate Champions, and to Mr. Forrest Ashby, captain of the team.]

Figure 1.—In a wrestling match, the contestants take a hold which is termed the "referee's hold," as shown in "A" and "B." The right hand of each is placed behind the other's neck, and the left under the elbow or the upper arm. The wrestlers are now ready to begin. From this position a double leg hold is often attempted, as shown by position "C." The double leg hold is broken by "D" taking a body hold upon "C."

Figure 2.—"A" has secured a body hold upon "B." The fall from this hold is secured by "A" pressing "B" backward to the floor. "D" has broken this hold by pushing backward in the face of "C."

Figure 3.—Half nelson and body lift. "A" slips his right arm under the right arm of "B" and forearm across the back of the neck. The left arm is across "B's" body. From this position, "A" presses till "B" is on his back. To break this hold, "B" interlocks his leg behind the leg of "A," as illustrated in "C" and "D."

Figure 4.—The hip lock. "B" takes a body hold around "A's" back, steps in front of "A's" body with the right foot, puts hip against the abdomen and grasps the head of "A" with the left hand. He then lifts him on hip, as in the figure, and pulls him over on shoulders to mat. This hold is checked by "A" placing his hand against the hip of "B," as shown in "C" and "D." A rear view of "C" and "D" is exhibited in order to show the break.

Figure 5.—Leg hold and sit back. "B" has attempted a body hold from the rear and "A" counters it by grasping the leg of "B." If "A" pulls on the leg of opponent, it will cause "B" to sit down with "A" on top. Then, by pressing back with the shoulders, "A" can pin the shoulders of "B" to the mat. "D" breaks the leg hold by grasping the wrist of "C" and then pulls "C" over on his shoulders.

Figure 6.—The half nelson. "A" has a body hold and half nelson on "B." "B" may break the hold and throw his opponent by locking his arm around the nelson arm of "A." He then dives forward and

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FIGURE 1

FIGURE 3

FIGURE 2

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FIGURE 4

FIGURE 5

FIGURE 6

FIGURE 7

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FIGURE 8

rolls to the right, with the resultant fall as in "C" and "D."

Figure 7.—Further arm drag hold. "A" has a further arm drag hold on "B," which, if followed up quickly, will pull "B" over on his back. In order to break this hold, "B" places his left leg out straight as in "D," which makes too great a leverage to be overcome.

Figure 8.—Further arm drag and bar. "B" has a further arm drag and bar hold across back on "A" which will pin the shoulders of "A" on the mat if he does not escape from this position. "A" breaks the hold by circling on his knees as in position "C."

Figure 9.—Foot hold between the legs. The foot hold or foot nelson has been secured by "B," and is quite painful. It will cause "A" to turn over on his back if he does not break it.

To escape, "A" must hold his weight on the right hand or arm, turn and press his left foot against his opponent's waist and push away the face with his left hand. This will cause "B" to release the foot of "A" and give "B" a chance to escape.

Figure 10.—Grapevine lock and drag. "A" has a grapevine lock around the leg of "B" and a drag hold of the arm. The grapevine lock is taken from the inside of the leg and together with arm drag will force "B" to his shoulders. When once this hold is secured, a fall is imminent.

The grapevine hold is one of the best methods in keeping a person underneath and thus tiring him out. The thighs of "C" are underneath the hips of "D" and the legs between, as in the figure. "D's" arms are also secured, thus rendering him powerless.

Figure 11.—Half nelson and leg nelson. Commence as in "A," using the left arm with a half nelson on the neck, and with the right hand secure a leg nelson by grasping the leg of "B," Pull the foot up till it is locked in the elbow, then pull opponent over on shoulders.

Half nelson and crotch hold. A half nelson and crotch hold is secured, as in "C" and "D" "C," who has secured the hold by a neck nelson and the right arm between the legs, now turns "D" over on his shoulders. It is difficult to get away from these holds when once secured.

Figure 12.—Back hammer lock and bar hold. "A" has a hammer lock on "B's" right arm and a bar hold on the left arm of "B." In this position, "A" tightly holds the hammer lock and twists his opponent around with the bar hold, and so brings him forward and to his side on the mat, from which

FIGURE 9

FIGURE 10

FIGURE 11

FIGURE 12

Posed under the direction of Wm. J. Cromie

FIGURE 13

FIGURE 14

position a fall may be secured. In intercollegiate wrestling an opponent is not allowed to press the arm beyond the horizontal (as in figure), in the hammer, as there is danger of breaking one's arm.

The body scissors hold. The scissors hold has been secured on the body of "D" by "C," who has one leg under and one over the body. "C" now crosses his feet and so renders "D" powerless. This is a very painful and tiring hold if "C" applies pressure. A scissors hold may also be secured on the head.

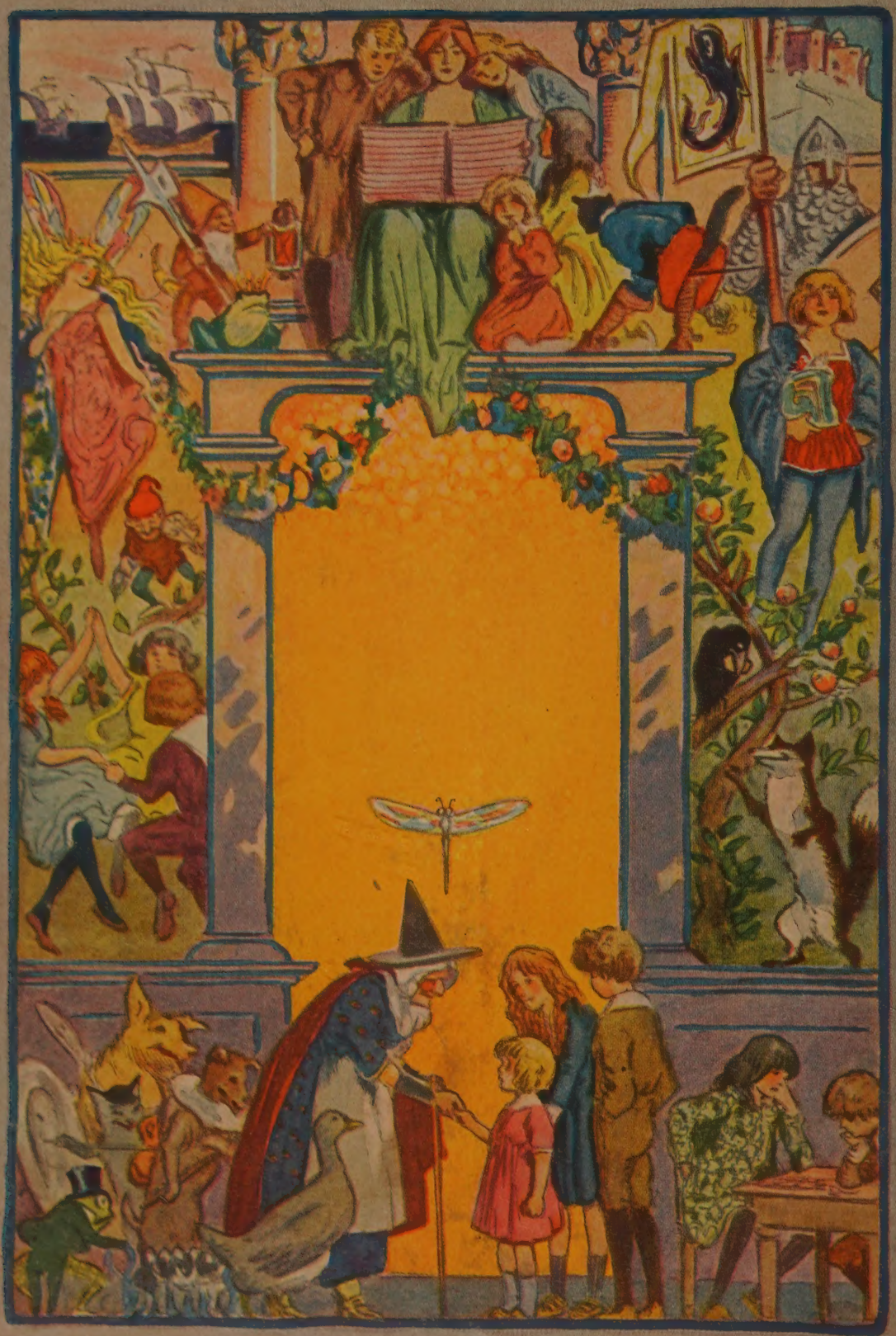
Figure 13.—The arm lock. "B" has broken a half nelson by pulling "A's" hand from behind neck and has locked it as in "A" and "B." From this position, "B" raises left leg and turns to the left, which will bring him on top "A."

The "Milligan Trip," Figure 13, "C" and "D." This leg hold and trip was a favorite hold used by Milligan, a former University of Pennsylvania Intercollegiate Champion and captain. "C" has a leg in front and behind the legs of "D." "C" pulls forward on the right arm of "D", which forces him to his knees. "D" cannot step forward or backward.

Figure 14.—Bridge. A bridge in wrestling is where the weight of the body is supported on the feet and head and the body pushed up as in "B." The person who is bridging should be able to support the weight of another without giving way. "A" has secured a quarter nelson on "B" and "B" has made it ineffective by bridging. A great many holds may be broken by the bridge. A bridge may be broken by placing the forearm across the front of the bridger's neck and pressing downward.

A bridge or head stand from crotch hold. "C" has attempted a crotch hold upon "D." "D," to avoid being rolled upon his shoulders, sustains the weight upon his head and thus performs a bridge or head stand.

Many combinations in wrestling not shown here may be attempted with success. Figure 4, "The Flying Mare, Figure 6, "The Cross Buttock," and Figure 7, "The Wrist and Crotch,' ' in "Self-Defense," may be included with this series of illustrations. I have avoided the strangle holds and the double nelson, which are not permitted in amateur wrestling.



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